This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

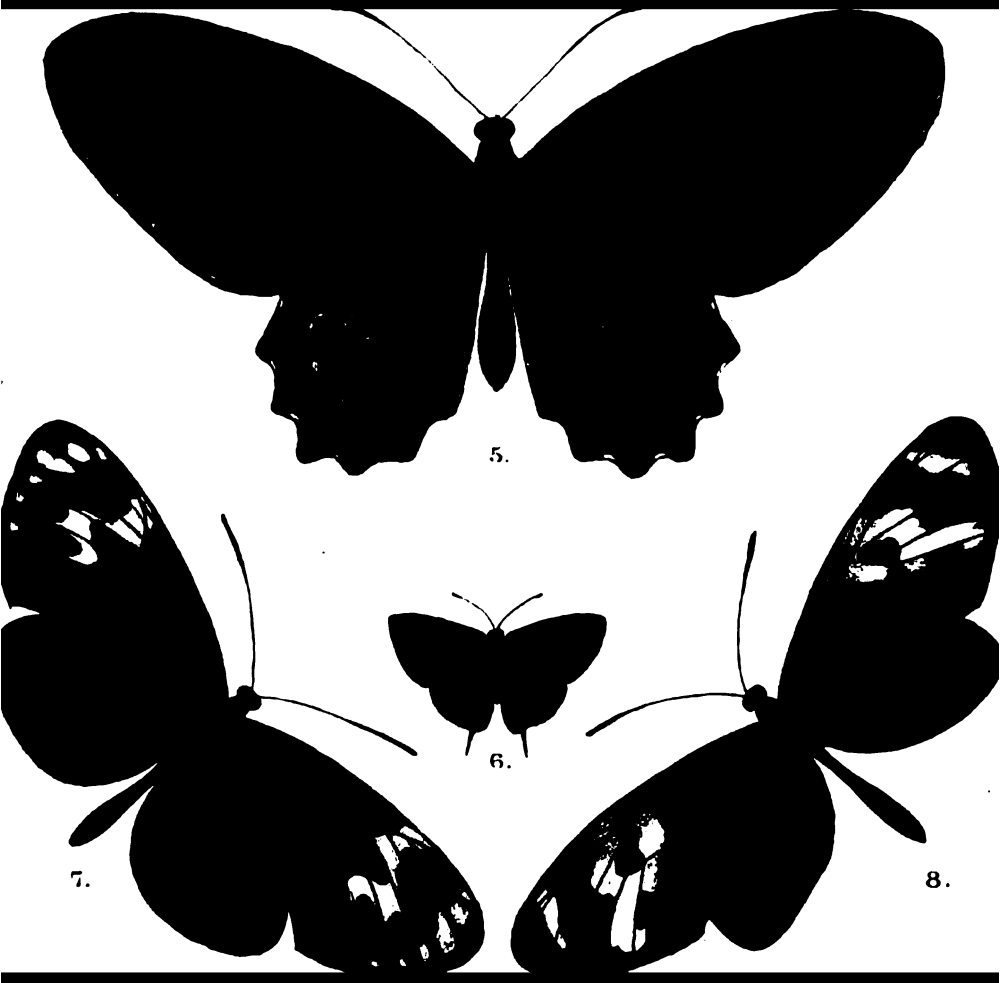
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`



The Transactions of the Entomological Society of ...

Royal Entomological Society of London

Digitized by Google

ROY
6452

HARVARD UNIVERSITY.

LIBRARY

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY.

7225.

H. A. Hagen Library.

October 8, 1903.

Digitized by Google

Digitized by Google

Digitized by Google

TRANSACTIONS

OF THE

ENTOMOLOGICAL SOCIETY

OF

LONDON.

Digitized by Google

Digitized by Google

THE

TRANSACTIONS

OF THE

ENTOMOLOGICAL SOCIETY

OF

LONDON

MUS. COMP. ZOOL.
LIBRARY

HARVARD
UNIVERSITY

FOR THE YEAR

1877.

LONDON:

PRINTED FOR THE SOCIETY BY C. ROWORTH AND SONS,
NEWTON STREET, HIGH HOLBORN;

SOLD AT THE SOCIETY'S ROOMS, 11, CHANDOS STREET,
CAVENDISH SQUARE,

AND BY LONGMAN, GREEN, READER AND DYER,
PATERNOSTER ROW.

1877.

Digitized by Google

Book. Museum

X/8103
7228

Digitized by Google

ENTOMOLOGICAL SOCIETY.

COUNCIL FOR 1877.

Prof. J. O. Westwood, M.A., F.L.S., &c.	*President.*
J. W. Douglas, Esq.	*Vice-Presidents.*
J. W. Dunning, Esq., F.L.S.	
Henry T. Stainton, Esq., F.R.S. ..	
J. Jenner Weir, Esq., F.L.S.	*Treasurer.*
Rev. T. A. Marshall	*Librarian.*
Ferdinand Grut, Esq., F.L.S.	*Secretaries.*
Raphael Meldola, Esq., F.R.A.S. ..	
Henry W. Bates, Esq., F.L.S.	*Other Members of Council.*
G. C. Champion, Esq.	
Rev. A. E. Eaton, M.A.	
Edward Saunders, Esq.	
Sir Sidney Smith Saunders, C.M.G. ..	

Digitized by Google

THE

TRANSACTIONS

OF THE

ENTOMOLOGICAL SOCIETY OF LONDON.

1834—1877.

	To the Public.	To Members.
First Series, 5 volumes (1834-1849).....Price	£6 0 0	£4 10 0
Second Series, 5 volumes (1850-1861).....	8 0 0	6 0 0
Third Series, 5 volumes (1862-1869)	11 0 0	8 5 0
The Transactions for the year 1868	1 0 0	0 15 0
„ „ 1869	1 2 0	0 16 6
„ „ 1870	1 8 0	1 1 0
„ „ 1871	1 5 0	0 18 9
„ „ 1872	1 2 0	0 16 6
„ „ 1873	1 16 0	1 7 0
„ „ 1874	1 12 0	1 4 0
„ „ 1875	1 2 0	0 16 6
„ „ 1876	1 12 0	1 4 0
„ „ 1877	1 4 0	0 18 0

Volume 5 of the First Series can no longer be obtained separately; all the other volumes may.

Longicornia Malayana may be obtained separately .. .. Price	£2 12 0	£1 19 0
Phytophaga Malayana, Pt. 1, *Apostasicera*, may be obtained separately	0 16 0	0 12 0

The Journal of Proceedings is bound up with the Transactions, but may be obtained separately, by Members *gratis*, by the Public, Price One Shilling per Sheet.

Members and Subscribers resident more than fifteen miles from London, who have paid the subscription for the current year, are entitled to receive a copy of the Transactions for the year without further payment, and they will be forwarded free, by post, to any address within the United Kingdom.

Members and Subscribers resident in, or within fifteen miles from London are entitled to a copy of the Transactions for the current year at half the price to the public, which copy may be obtained on application to the Librarian: or all such Members or Subscribers who, in addition to their Subscription for the current year, shall, at or before the April Meeting of the Society, pay a farther contribution of *Half-a-Guinea*, shall be entitled to receive a copy of the Transactions for the year without farther payment, which copy will be forwarded free by post.

Digitized by Google

CONTENTS.

	PAGE
Explanation of the Plates	viii
Errata	viii
List of Members	ix
Additions to the Library	xvii

MEMOIRS.

	PAGE
I. Descriptions of twenty new species of *Coleoptera* from various localities. By CHAS. O. WATERHOUSE ..	1
II. Notes on the African *Saturniidæ* in the Collection of the Royal Dublin Society. By W. F. KIRBY, Assistant Naturalist, R.D.S.	15
III. Descriptions of new genera and species of Phytophagous Beetles belonging to the family *Cryptocephalidæ*, together with diagnoses and remarks on previously described genera. By JOSEPH S. BALY, F.L.S., &c. ..	23
IV. Descriptions of new species of Phytophagous Beetles belonging to the family *Eumolpidæ*; and a Monograph of the genus *Eumolpus*. By JOSEPH S. BALY, F.L.S., &c.	37
V. Descriptions of new species of the genera *Pseudomyrma* and *Tetraponera*, belonging to the family *Myrmicidæ*. By FREDERICK SMITH	57
VI. A Monograph of the Australian species of the Coleopterous family *Lycidæ*. By CHAS. O. WATERHOUSE .	73
VII. Descriptions of new genera and species of East Indian *Tenthredinidæ*. By PETER CAMERON	87
VIII. The Geographical Distribution of *Danais Archippus*. By W. L. DISTANT	93
IX. On the *Lepidoptera* of the Amazons, collected by JAMES W. H. TRAIL, Esq., during the years 1873 to 1875. By ARTHUR GARDINER BUTLER, F.L.S., F.Z.S., &c...	105
X. Descriptions of new genera and of uncharacterized species of *Halticinæ*. By JOSEPH S. BALY, F.L.S. ..	157
XI. Notes upon a Strepsipterous insect parasitic on an exotic species of *Homoptera*. By J. O. WESTWOOD, M.A., F.L.S., Pres. Ent. Soc., &c.	185
XII. Notes on the genus *Prosopistoma* of Latreille. By J. O. WESTWOOD, M.A., F.L.S., Pres. Ent. Soc., &c. ..	189
XIII. On the Adult Larvæ of the *Stylopidæ* and their Puparia. By Sir SIDNEY SMITH SAUNDERS, C.M.G. With Remarks and Figures, by Professor WESTWOOD, M.A., &c., Pres. Ent. Soc.	195
XIV. On *Ceratorrhina quadrimaculata* (Fabr.), and descriptions of two new allied species. By H. W. BATES, F.L.S.	201
XV. On the Food of gaily-coloured Caterpillars. By J. W. SLATER	205
XVI. Descriptions of new genera and species of *Cryptocephalidæ*. By JOSEPH S. BALY, F.L.S.	211

Digitized by Google

PAGE

XVII. Notes on the new or rare *Sphingidæ* in the Museum of the Royal Dublin Society, and Remarks on Mr. Butler's recent revision of the Family. By W. F. KIRBY, Assistant Naturalist, R.D.S. 233

XVIII. Descriptions of new species of *Cleridæ*. By the Rev. H. S. GORHAM 245

XIX. On the variation of *Rhopalocerous* forms in South Africa. By J. P. MANSEL WEALE, B.A., Oxon 265

XX. Vivarium Notes on some common *Coleoptera*. By J. W. SLATER 277

XXI. Note on *Mygale stridulans*. By Prof. JAMES WOOD-MASON 281

XXII. Descriptions of new genera and of uncharacterized species of *Halticinæ*. By JOSEPH S. BALY, F.L.S. .. 283

XXIII. On the *Lepidoptera* of the family *Lithosiidæ*, in the Collection of the British Museum. By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c. 325

XXIV. Descriptions of new species of the Coleopterous genus *Callirrhipis* (Rhipidoceridæ) in the British Museum. By CHAS. O. WATERHOUSE 379

XXV. Descriptions of a new genus and two new species of *Sphingidæ*, with general remarks on the family. By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c. 395

XXVI. Descriptions of new species of *Cleridæ*, with notes on the genera and corrections of synonymy. By the Rev. H. S. GORHAM 401

XXVII. On *Notiothauma Reedi*, a remarkable new genus and species of *Neuroptera* from Chili, pertaining to the family *Panorpidæ*. By R. M'LACHLAN, F.R.S., &c. 427

XXVIII. Entomological Notes. By J. O. WESTWOOD, M.A., F.L.S., Pres. Ent. Soc. 431

Proceedings for 1877 i

Index lxxvii

EXPLANATION OF THE PLATES.

Plate I. ..	..See page 73—79	Plate VI. ..	.. See page 197
Plate II. ..	.. „ 79—86	Plate VII...	.. „ 281
Plate III. ..	.. „ 156	Plate VIII.	.. „ 377
Plate IV. ..	.. „ 187, 194	Plate IX. ..	.. „ 395
Plate V. ..	.. „ 194	Plate X. ..	430, 433, 437, 439

ERRATA.

Page 281, after line 2, insert "Plate VII."

„ 438, line 13, for "*Zoida*," read "*Zaida*."

In the Journal of Proceedings :—

Page xvii, lines 15 and 17, for "*Himanopterus*," read "*Himantopterus*."

„ „ line 10 (from bottom), for "van Volxen," read "van Volxem."

„ „ line 15 (from bottom), for "van Volxen at Lacken," read "van Volxem at Laeken."

„ xxvii, line 11 (from bottom), for "Hoffmann," read "Hilgendorff."

„ xxxii, line 13, for "scxes," read "sexes."

„ „ line 7 (from bottom), for "acoustal," read "acoustical."

„ „ line 13 (from bottom), for "exhibiten," read "exhibited."

Digitized by Google

List of Members

OF THE

ENTOMOLOGICAL SOCIETY

OF LONDON.

31ST DECEMBER, 1877.

Digitized by Google

LIST OF MEMBERS

OF

THE ENTOMOLOGICAL SOCIETY

OF LONDON.

Honorary Members.

Burmeister, Hermann, Buenos Ayres.
Guenée, Achille, Chateaudun.
Hagen, H. A., Cambridge, U.S.A.
Leconte, John L., Philadelphia.
Milne-Edwards, H., Paris.
Saussure, H. de, Geneva.
Schiödte, J. C., Copenhagen.
Selys-Longchamps, E. de, Liége.
Siebold, C. T. E. von, Munich.
Zeller, P. C., Stettin.

Digitized by Google

ORDINARY MEMBERS AND SUBSCRIBERS.

Marked * *are Original Members.*
Marked † *have compounded for their Annual Subscriptions.*
Marked S *are Annual Subscribers.*

Date of Election.		
1877		Adams, Herbert Jordan, *Chase Park, Enfield*, N.
1877		Adams, Frederick Charlstrom, *Chase Park, Enfield*, N.
1867	S.	Archer, F., *Little Crosby Road, Crosby, Liverpool.*
1856		Armitage, Edward, R.A., 3, *Hall Rd., St. John's Wood*, N.W.
*	†	Babington, Charles Cardale, M.A., F.R.S., &c., Professor of Botany, 5, *Brookside, Cambridge.*
1850		Baly, Joseph S., M.R.C.S., F.L.S., *The Butts, Warwick.*
1865		Barton, Stephen, 32, *St. Michael's Hill, Bristol.*
1867	S.	Bates, Frederick, 15, *Northampton Square, Leicester.*
1861		Bates, Henry Walter, F.L.S., F.Z.S., 40, *Bartholomew Road, Kentish Town*, N.W.
1851		Beaumont, Alfred, *Steps Mills, Huddersfield.*
1876		Berens, Alexander Augustus, *Spratton Grange, Northampton.*
1866		Bicknell, Percy, *Beckenham, Kent.*
1872		Bird, G. W., *The Dartons, Dartford, Kent.*
*		Blomefield, Rev. Leonard, M.A., F.L.S., &c., 19, *Belmont, Bath.*
1841		Bond, Fred., F.Z.S., 5, *Fairfield Avenue, Staines.*
1860		Bonvouloir, Vicomte Henri de, 15, *Rue de l'Université, Paris.*
1875		Borrer, William, junr., *Cowfold, Sussex.*
1876		Boscher, Edward, *Bellevue House, Twickenham.*
1852	†	Boyd, Thomas, *Surrey Lodge, Hornend Road, Norwood*, S.E.
1867		Boyd, William Christopher, F.L.S., *Cheshunt, Herts.*
1856		Braikenridge, Rev. George Weare, M.A., F.L.S., *Clevedon, Bristol.*
1877		Briggs, Charles Adolphus, 55, *Lincoln's Inn Fields*, W.C.
1870		Briggs, Thos. Hy., M.A., 6, *Old Square, Lincoln's Inn*, W.C.
1869	S.	Brown, N. E., *Brighton Road, Red Hill.*
1862		Browne, Rev. Thomas Henry, M.A., F.G.S., *The Cedars, High Wycombe, Bucks.*
1874	S.	Bull, R. E., 85, *Milton Street, Dorset Square*, N.W.
1855		Burnell, Edward Henry, 32, *Bedford Row*, W.C.
1868	†	Butler, Arthur Gardiner, F.L.S., F.Z.S., 10, *Avington Grove, Penge*, S.E.
1860		Candèze, Dr. E., *Glain, Liége.*
1877	S.	Capron, Edward, M.D., *Shere, Guildford.*
1877	S.	Carmichael, Thomas D. Gibson, *Castle Craig, Dolphinton*, N.B.
1868		Carrington, Charles, *Ellerslie, Lower Merton*, S.W.
1871		Champion, G. C., 274, *Walworth Road*, S.E.
1875	S.	Chapman, Thomas, 56, *Buchanan Street, Glasgow.*

Digitized by Google

Date of Election.		
1871		Charlton, Ernest S., *Hesleyside, Bellingham, Hexham.*
1867		Clarke, Alexander Henry, 16, *Furnival's Inn*, E.C.
1865	S.	Clarke, Charles Baron, M.A., F.L.S., 17, *Chowringhee, Calcutta.*
1877	S.	Cluse, Valentine, *Whytecliffe Road, Caterham Junction.*
1874		Cockle, Captain George, 9, *Bolton Gardens*, S.W.
1873	S.	Cole, Benjamin G., *Ivy Cottage, Hermon Hill, Wanstead*, E.
1873		Cole, William, *Ivy Cottage, Hermon Hill, Wanstead*, E.
1865		Colquhoun, Hugh, M.D., *Anchorage, Bothwell*, N.B.
1865	S.	Cooke, Benj., *Sunnyside Cottage, Bowdon, Altrincham.*
1876	†	Copperthwaite, William Charles, *The Lodge, Malton.*
1853		Cox, Colonel C. J., *Fordwich House, Canterbury.*
1867		Cox, Herbert Edward, *Rosenheim, Reigate.*
1868		Cumming, Linnæus, B.A., 22, *Warwick Square, Rugby.*
1868		Curzon, E. P. Roper.
1873		Dale, C. W., *Glanville's Wootton, Sherborne.*
1865		Dallas, William Sweetland, F.L.S., Geological Society, *Burlington House*, W.
•	†	Darwin, Charles, M.A., F.R.S., F.L.S., &c., *Down, Beckenham, Kent.*
1849	S.	Dawson, John, *Carron, Falkirk, Stirlingshire.*
1837		Devonshire, William Cavendish, Duke of, K.G., F.R.S., &c., *Devonshire House*, 78, *Piccadilly*, W.
1875	S.	Dickson, Professor William, Curator of the University Library, *Glasgow.*
1875		Distant, William Lucas, 1, *Selston Villas, Derwent Grove, East Dulwich*, S.E.
1855		Dohrn, Dr. C. A., Pres. Entomological Society of Stettin, *Stettin.*
1873		Doria, Marquis Giacomo, *Strada Nuova, Genoa.*
1874	S.	Dormer, John Baptist Joseph Dormer, Lord, *Grove Park, Warwick.*
1876		Douglas, John William, 8, *Beaufort Gardens, Lewisham*, S.E.
1874		Dowsett, Arthur, 16, *North Street, Brighton.*
1867		Druce, Herbert, F.L.S., F.Z.S., 1, *Circus Road, St. John's Wood*, N.W.
1867	S.	Duer, Yeend, *Cleygate House, Esher.*
1849	†	Dunning, Joseph William, M.A., F.L.S., F.Z.S., 24, *Old Buildings, Lincoln's Inn*, W.C.
1874		Du Pré, Charles Christian, F.L.S., *Yonge House*, 35A, *Russell Road, Kensington*, W.
1865		D'Urban, W. S. M., F.L.S., *Albuera, St. Leonards, Exeter.*
1865		Eaton, Rev. Alfred Edwin, M.A., *Chislehurst, Kent.*
1869		Emich, Gustave d', *Pesth, Hungary.*
1876	S.	Enock, Frederic, 30, *Russell Road, Seven Sisters' Road, Holloway*, N.
1876		Fenn, Charles, *Ashley House, Eltham Road, Lee*, S.E.
1874		Fitch, Edward A., *Brick House, Maldon, Essex.*
1874	S.	Fitch, Frederick, *Hadleigh House, Highbury New Park*, N.
1865		Fletcher, J. E., *Happy Land, Worcester.*
1875		Forbes, W. A., *St. John's College, Cambridge.*

Digitized by Google

Date of Election.		
1870		Freeland, H. W., M.A., *Chichester.*
1869	†	French, Rev. David John, F.L.S., F.Z.S., F.H.S., &c.
1855		Fry, Alexander, F.L.S., *Thornhill House, Dulwich Wood, Park, Norwood,* S.E.
1876		Fryer, Herbert Fortescue, *Chatteris, Cambridgeshire.*
1865		Fust, H. Jenner, jun., M.A., *Hill Court, Falfield, Gloucester.*
1874		Garneys, W., M.R.C.S., *Repton, Burton-on-Trent.*
1865	†	Godman, Frederick Du Cane, M.A., F.L.S., &c., *Park Hatch, Godalming.*
1875	S.	Gooch, W. D., *Spring Vale, Little Umhlanga, Victoria County, Natal.*
1855		Gorham, Rev. Henry Stephen, *Shipley, Sussex.*
1874		Goss, Herbert, *The Avenue, Surbiton Hill, Surrey.*
*		Gould, John, F.R.S., F.L.S., &c., 26, *Charlotte Street, Bedford Square,* W.C.
1850		Gray, John, *Wheatfield House, Bolton, Lancashire.*
1865		Greene, Rev. J., M.A., *Rostrevor, Apsley Rd., Clifton, Bristol.*
1872		Greening, Noah, *Warrington.*
1876		Grube, Professor Edward, Director of the Zoological Museum of the University of Breslau, *Breslau.*
1846		Grut, Ferdinand, F.L.S., SECRETARY, 9, *King Street, Southwark,* S.E.
1850	†	Guyon, George, *Southcliff Cottage, Ventnor, Isle of Wight.*
1877		Harding, George, *Stapleton, near Bristol.*
1874		Harford, Henry C., Lieut. 99th Regiment, *Carrick-on-Suir.*
1858		Harold, Baron Edgar von, 52, *Barerstrasse, Munich.*
1864		Harper, P. H., 30, *Cambridge Street, Hyde Park Square,* W.
1846		Hewitson, William Chapman, F.L.S., F.Z.S., *Oatlands, Weybridge.*
1866		Higgins, E. T., M.R.C.S., 24, *Bloomsbury Street,* W.C.
1876	†	Hillman, Thomas Stanton, *Delves House, Ringmer, Lewes.*
1869		Holdsworth, Edward, *Shanghai.*
1876	†	Horniman, Frederick John, F.L.S., F.R.G.S., F.Z.S., &c., *Surrey House, Forest Hill,* S.E.
1865		Hudd, A. E., 96, *Pembroke Road, Clifton, Bristol.*
1870		Jacques, F. V., 7, *Apsley Road, Clifton, Bristol.*
1869	S.	Janson, E. M., *Las Lajas, Chontales, Nicaragua.*
1843		Janson, Edward W., 32, *Victoria Road, Finsbury Park,* N.
1869		Janson, Oliver E., 32, *Victoria Road, Finsbury Park,* N.
1853		Jekel, Henri, 2, *Rue Letort, Paris.*
1872	S.	Jenner, J. H. A., *High Street, Lewes.*
1865	S.	John, Evan, *Llantrissant, Pontypridd.*
1876		Katter, Dr. F., *Putbus, Rügen, North Prussia.*
1876	†	Kay, John Dunning, *Leeds.*
1872		Kaye, Ernest St. G., *Jessore, Bengal.*
1876		Kraatz, Dr. G., President of the Berlin Entomological Society, *Link Strasse, Berlin.*
1861		Kirby, W. F., Royal Dublin Society, *Kildare Street, Dublin.*
1842		Kuper, Rev. Charles Augustus Frederick, M.A., *The Vicarage, Trellech, Chepstow.*

Digitized by Google

Date of Election.		
1875		Lamarche, Oscar, 70, *Rue Louvrex, Liége.*
1868		Lang, Major A. M., R.E., Thomason Civil Engineering College, *Roorkee, India.*
1865		Latham, A. G., *Weaste Hall, Pendleton, Manchester.*
1868		Lendy, Capt. Augustus F., F.L.S., *Sunbury House, Sunbury,* S.W.
1876		Lewis, George, *Queen's Road, Putney,* S.W.
1876		Lichtenstein, Jules, *La Lironde, near Montpellier.*
1835	†	Lingwood, Robert Maulkin, M.A., F.L.S., 6, *Park Villas, Cheltenham.*
1872	S.	Livett, H. W., M.D., *Wells, Somerset.*
1875		Livingstone, Clermont, *Tudor Lodge, Snaresbrook,* E.
1865	†	Llewelyn, J. Talbot Dillwyn, M.A., F.L.S., *Ynisgerwn, Neath.*
1849		Logan, R. F., *Spylaw House, Colinton, near Edinburgh.*
1850	S.	Lowe, W. H., M.D., *Woodcote Lodge, Inner Park Road, Wimbledon Park,* S.W.
1850	†	Lubbock, Sir John, Bart., M.P., F.R.S., F.L.S., &c., *High Elms, Farnborough, Kent.*
1851	†	M'Intosh, J.
1858		M'Lachlan, Robert, F.R.S., F.L.S., 39, *Limes Grove, Lewisham,* S.E.
1869	†	Marseul, L'Abbé S. A. de, *Boulevard Pereire,* 271, *Paris.*
1873	S.	Marsh, John George, 842, *Old Kent Road,* S.E.
1865		Marshall, Rev. Thomas Ansell, M.A., F.L.S., LIBRARIAN, *The Manor House, Belsize Park Gardens, Hampstead,* N.W.
1856	†	Marshall, William, *Elm Lodge, Clay Hill, Enfield.*
1874	†	Mason, Philip Brooke, M.R.C.S., F.L.S., *Burton-on-Trent.*
1865		Mathew, Gervase F., R.N., F.L.S., F.Z.S., H.M.S. Britannia, *Dartmouth.*
1860		May, Joseph William, *Arundel House, Percy Cross, Fulham Road,* S.W.
1865	S.	Meek, Edward G., 56, *Brompton Road,* S.W.
1872		Meldola, Raphael, F.R.A.S., F.C.S., SECRETARY, 21, *John Street, Bedford Row,* W.C.
1871	S.	Miskin, W. H., Supreme Court, *Brisbane, Queensland.*
1866		Mniszech, Comte G. de, 22, *Rue Balzac, Paris.*
1853		Moore, Frederic, 110, *Oakfield Road, Penge,* S.E.
1872		Moreton, Lord, 16, *Portman Square,* W.
1859		Mosse, G. Staley, 16, *Stanford Road, Kensington, W.*
1869	†	Müller, Albert, F.R.G.S., 72, *Grenzacher Strasse, Basle, Switzerland.*
1876		Müller, Dr. Clemens.
1872	†	Murray, Lieut. H., 70th Brigade Depôt, *Tralee, Ireland.*
1870		Murray, Rev. Richard Paget, M.A., *Baltonsboro Parsonage, Glastonbury.*
1869		Oberthur, Charles (fils), *Rennes.*
1877		Oberthur, René, *Rennes.*
1873		Olivier, Ernest, *Moulins (Allier), France.*
1841	†	Owen, Richard. C.B., M.D., F.R.S., F.L.S., &c., *British Museum,* W.C.

Digitized by Google

Date of Election.		
1840	†	Parry, Major Frederick John Sidney, F.L.S., 18, *Onslow Square*, S.W.
1854		Pascoe, Francis P., F.L.S., 1, *Burlington Road, Westbourne Park*, W.
1872		Phipson, Arthur, 1 *Field Court, Gray's Inn*, W.C.
1872		Pictet, Edward, *Avenue du Pin, Genève.*
1870		Porritt, George T., F.L.S., *Huddersfield.*
1874	S.	Power, Henry d'Arcy, F.L.S., 8, *Manor Terrace, New Church Road, Camberwell*, S.E.
1851		Preston, Rev. Thomas Arthur, M.A., F.L.S., *The College, Marlborough.*
1876		Preudhomme de Borre, Alfred, Secretary of the Entomological Society of Belgium, 21, *Boulevard du Regent, Brussels.*
1867	S.	Pryer, H. J. S., *Yokohama, Japan.*
1870		Puls, J. C., *Place de la Calandre, Ghent.*
1872	S.	Ransom, William Henry, M.D., F.R.S., *The Pavement, Nottingham.*
1874		Reed, Edwyn C., F.L.S., *Museo Nacional, Santiago de Chile.*
1871		Riley, C. V., State Entomologist, *St. Louis, Missouri.*
1853		Ripon, George Frederick Samuel Robinson, Marquis of, K.G., F.R.S., F.L.S., 1, *Carlton Gardens*, S.W.
1869		Robinson-Douglas, William Douglas, F.L.S., F.R.G.S., *Orchardton, Castle-Douglas*, N.B.
1877	S.	Roebuck, William Denison, 9, *Sunnybank Terrace, Leeds.*
1872	S.	Rothera, G. B., *High Street Place, Nottingham.*
1868		Rothney, G. A. J., *Calcutta.*
1876	†	Rutherford, David Greig, F.L.S., F.R.G.S., F.Z.S., &c., *Surrey House, Forest Hill*, S.E.
1876	†	Rye, Edward Caldwell, F.Z.S., *Parkfield, Putney*, S.W.
1865		Rylands, Thomas Glazebrook, F.L.S., F.G.S., *Highfields, Thelwall, Warrington.*
1875		Sallé, Auguste, 13, *Rue Guy de la Brosse, Paris.*
1866	†	Salvin, Osbert, M.A., F.R.S., F.L.S., &c., 6, *Tenterden Street, Hanover Square*, W., and *Brookland Avenue, Cambridge.*
1865	†	Saunders, Edward, F.L.S., *Holmesdale, Upper Tooting*, S.W.
1861	†	Saunders, G. S., *Spencer Park, Wandsworth*, S.W.
•		Saunders, Sir Sidney Smith, C.M.G., *Gatestone, Central Hill, Upper Norwood*, S.E.
•	†	Saunders, William Wilson, F.R.S., F.L.S., &c., *Raystead, Worthing.*
1865		Schaufuss, L. W., Ph. D., M. Imp., L. C. Acad., &c., *Dresden.*
1875	†	Sealy, Alfred Forbes, *Cochin, South India.*
1864		Semper, George, *Altona.*
1862		Sharp, David, M.B., *Eccles, Thornhill, Dumfriesshire.*
1847		Shepherd, Edwin, 21, *Albert Terrace, Clapham Road*, S.W.
1852		Sheppard, Edward, F.L.S., 18, *Durham Villas, Kensington*, W.
1867		Sidebotham, Joseph, *The Beeches, Bowdon, Cheshire.*
1877		Slater, Joseph William, 2, *Tamworth Terrace, Hornsey Road*, N.
1850		Smith, Frederick, 27, *Richmond Crescent, Islington*, N.

Digitized by Google

Date of Election.		
1869		Smith, Henley Grose, *Warnford Court, Throgmorton Street*, E.C.
*	†	Spence, W. B.
1848	†	Stainton, Henry Tibbats, F.R.S., F.L.S., &c., *Mountsfield, Lewisham*, S.E.
1862		Stevens, John S., 38, *King Street, Covent Garden*, W.C.
1837		Stevens, Samuel, F.L.S., *Loanda, Beulah Hill, Upper Norwood*, S.E.
1876		Swale, Harold, 48, *St. George's Road, S. Belgravia*, S.W.
1866		Swanzy, Andrew, F.L.S., *Sevenoaks.*
1876		Swinton, A. H., *Binfield House, Waterden Road, Guildford.*
1854	S.	Thompson, Miss Sophia, *Barn Hill, Stamford.*
1856		Thomson, James, 12, *Rue de Presbourg, Place de l'Etoile, Paris.*
1838		Thwaites, George Henry Kendrick, Ph. D., F.R.S., F.L.S., Director of the Royal Botanic Garden, *Peradenia, Ceylon.*
1853	S.	Tompkins, H., 28, *Tavistock Square*, W.C.
1859	†	Trimen, Roland, F.L.S., *Colonial Office, Cape Town, Cape of Good Hope.*
1874		Tuely, Nathaniel Clissold, F.L.S., *Mortimer Lodge, Wimbledon Park*, S.W.
1869		Vaughan, Howard, 55, *Lincoln's Inn Fields*, W.C.
1849		Vaughan, P. H., *Redland, Bristol.*
1866		Verrall, G. H., *Friar's Cottage, Lewes, Sussex.*
1876		Wakefield, Charles Marcus, F.L.S., *The Elms, Uxbridge.*
1870		Walker, Rev. Francis Augustus, M.A., F.L.S., *Dry Drayton Rectory, Cambridge.*
1858		Wallace, Alexander, M.D., *Trinity House, Colchester.*
1863		Wallace, Alfred Russel, F.L.S., F.Z.S., &c., *Rosehill, Dorking.*
1866		Walsingham, Thomas de Grey, Lord, M.A., F.Z.S., &c., 23, *Arlington Street*, W.
1874	S.	Ward, Allan Ogier, 3A, *King William Street*, E.C.
1866		Ward, Christopher, F.L.S., *Savile Road, Halifax.*
1875		Ward, Frederick Henry, *Springfield, Tooting*, S.W.
1850		Waring, S. L., *The Oaks, Norwood*, S.E.
1869		Waterhouse, Charles O., *British Museum*, W.C.
*		Waterhouse, George R., F.Z.S., &c., *British Museum*, W.C.
1869		Websdale, C. G., 78, *High Street, Barnstaple.*
1845		Weir, John Jenner, F.L.S., TREASURER, 6, *Haddo Villas, Blackheath*, S.E.
1876		Western, Edward Young, 8, *Craven Hill, Bayswater*, W.
*		Westwood, John Obadiah, M.A., F.L.S., &c., PRESIDENT, Hope Professor of Zoology, *Walton Manor, Oxford.*
1868	†	White, F. Buchanan, M.D., F.L.S., *Perth*, N.B.
1865		White, Rev. William Farren, *Stonehouse Vicarage, Gloucestershire.*
1874		Wilson, Owen, *Cwmffrwd, Carmarthen.*
1843		Wollaston, T. Vernon, M.A., F.L.S., 1, *Barnepark Terrace, Teignmouth, Devon.*
1874		Wood-Mason, James, Curator of the Indian Museum, *Calcutta.*
1862		Wormald, Percy C., 2, *Clifton Villas, Highgate Hill*, N.
1865	S.	Young, Morris, *Free Museum, Paisley.*

Digitized by Google

ADDITIONS TO THE LIBRARY

DURING THE YEAR

1877.

Abeille (L'.), redigé par M. S. A. de Marseul, Nos. 183, 186, 188 à 196.

American Naturalist (The). Vol. I. Salem (Mass.) 1867—8.

Ditto. ditto. Vol. X., Nos. 11 & 12. Vol. XI., Nos. 1, 2, & 5 to 11. 8vo. Boston, 1876—7.

ANDERSON (Dr. J.), Note on the Floral Simulation of *Gongylus gongylodes*, Linn. 8vo. 1877.

BERG (Carl), Beiträge zu den Pyralidinen Südamerika's.

Beitrag zur Lepidopteren-Fauna Liv,—Kur-und Estlands. 8vo. Riga, 1874.

Ueber im Wasser lebende Bombyx-Raupen. 8vo. Riga, 1875.

Untersuchungen über die Gattung Mimallo Hübner's und ihre Arten.

Patagonische Lepidopteren beobachtet auf eine Reise im Jahre, 1874. 8vo. Moscow, 1876.

Memoria sobre Orugas Acuáticas de la Familia de los Bombycidæ. 8vo. Buenos Aires, 1876.

Estudios Lepidopterologicos acerca de la Fauna Argentina, Oriental y Brasilera. 8vo. Buenos Aires, 1877.

BOUCARD (Adolphe), Monographic List of the Coleoptera of the Genus *Plusiotis* [Rutelidæ] of America, North of Panama, with descriptions of several new species. 8vo. London, 1875.

BRIOSI (Giovanni), Sulla Phytoptosi della Vite (*Phytoptus vitis*, Landois). 8vo. Palermo, 1877.

Intorno alla Malattia denominata Marciume dell'uva. 8vo. Palermo, 1877.

BURMEISTER (Dr. H.), Description Physique de la République Argentine. Tomes 1 & 2. 8vo. Paris, 1876.

Canadian Entomologist (The). Vol. VIII., No. 11. Vol. IX., Nos. 1 to 6, & 8 to 10, 8vo. London (Ontario), 1876—77.

CARPENTER (Lieut. W. L.), Report on the Collections made by him in 1873, while connected with the United States Geological Survey. 8vo. Washington, 1875.

On the Alpine Insect-Fauna of Colorado. By Lieut. W. L. Carpenter, U.S.A.

List of Species of Butterflies collected by W. L. Carpenter for the U. States Geological Survey of Colorado, 1873. By W. H. Edwards.

On the Geographical Distribution of the Moths of Colorado. By A. S. Packard, Jun., M.D.

Report on the Diptera collected by Lieut. W. L. Carpenter in Colorado during the summer of 1873. By C. R. Osten-Sacken.

Notice on the Galls collected by Lieut. W. L. Carpenter. By C. R. Osten-Sacken.

Digitized by Google

CARPENTER (Lieut. W. L.), List of Species of Coleoptera collected by Lieut. W. L. Carpenter for the United States Geological Survey of Colorado, 1873. By Henry Ulke.

Report on the Pseudo-Neuroptera and Neuroptera collected by Lieut. W. L. Carpenter, in 1873, in Colorado. By H. A. Hagen.

Report of the Myriopods collected by Lieut. W. L. Carpenter, in 1873, in Colorado. By A. S. Packard, Jun., M.D.

Report on the Amphipod Crustaceans. By S. I. Smith.

Description of a Lernæan Crustacean (Achtheres Carpenteri) obtained by Lieut. W. L. Carpenter, in 1873, in Colorado. By A. S. Packard, Jun., M.D.

Synopsis of the Fresh-Water Phyllopod Crustacea of North America. By A. S. Packard, Jun., M.D.

Catalogue of Scientific Papers. Vol. VII. (1864 to 1873). 4to. London, 1877. [Published by the Royal Society.]

CHAMBERS (V. T.), Papers on the Tineina and Entomostraca of Colorado. 8vo. Washington, 1877.

Art. vi. The Tineina of Colorado.

„ vii. Notes on a Collection of Tineid Moths made in Colorado, in 1875, by A. S. Packard, Jun., M.D.

„ viii. On the Distribution of Tineina in Colorado.

„ ix. New Entomostraca from Colorado.

CHEVROLAT (Auguste), Mémoire de la Famille des Clérites. 8vo. Paris, 1876.

DOUGLAS (J. W.) and SCOTT (John), The British Hemiptera. Vol. I. Hemiptera-Heteroptera. 8vo. London, 1865.

EDWARDS (William H.), Catalogue of the Lepidoptera of America North of Mexico. Part I. Diurnals. 8vo. Philadelphia, 1877.

List of Species of Butterflies collected by Campbell Carrington and William B. Logan of the Expedition in 1871. [Report of the U.S. Geological Survey of Montana. 8vo. Washington, 1872.]

List of Butterflies collected in Colorado. *See* "CARPENTER (W. L.)"

Entomologist (The), an Illustrated Journal of British Entomology. Edited by John T. Carrington and others. Vol. X. 8vo. London, 1877.

Entomologist's Monthly Magazine (The). Vol. XIV., Nos. 152 to 163. 8vo. London, 1877.

Enumeratio Insectorum Norvegicorum. 8vo. Christiania, 1875—6.

Fasciculus ii. Catalogum Coleopterorum continens, Auctore H. Siebke.

„ iii. Catalogum Lepidopterorum continentem, Auctore H. Siebke defuncto: edidit J. Sparre Schneider.

FLOR (Dr. Gustav), Die Rhyncoten Livlands. 1 & 2 Theil. 8vo. Dorpat, 1860—61.

GEMMINGER (Dr.) and DE HAROLD (B.), Catalogus Coleopterorum hucusque descriptorum Synonymicus et Systematicus. Tom. xii. 8vo. Monachii, 1876.

GLOVER (Townend), Manuscript Notes from my Journal; or Illustrations of Insects, Native and Foreign. Order Hemiptera, Sub-Order Heteroptera or Plant-Bugs. Small folio. Washington, 1876.

GOODMAN (Neville), On a striking instance of Mimicry, with some Notes on the Phenomenon of Protective Resemblance. 8vo. Cambridge, 1877.

GRABER (Dr. Vitus), Der Organismus der Insekten. 12mo. München, 1877. ["Naturkräfte," xxi. Band.]

Digitized by Google

GROTE (A. R.), Check-List of the Noctuidæ of America North of Mexico. II. Noctuelitæ, Deltoides, and Noctuo-Phalænidæ. 8vo. Buffalo (N. Y.), 1876.

Notes on a Collection of Noctuid Moths made in Colorado, in 1875, by Dr. A. S. Packard. 8vo. Washington, 1857.

HAGEN (Dr. H.), Symphrasis eine neue Mantispiden-Gattung. 8vo. Stettin, 1877.

Report upon the Collections of Neuroptera and Pseudo-Neuroptera made in portions of Colorado, New Mexico, and Arizona, during the years 1872, 1873 and 1874.

Report on the Pseudo-Neuroptera and Neuroptera collected by Lieut. W. L. Carpenter, in 1873, in Colorado. *See* "CARPENTER (W. L.)"

HEWITSON (W. C.), Exotic Butterflies, Part 100. 4to. London, 1877.

Illustrations of Diurnal Lepidoptera. Part VII. Lycænidæ. 4to. Lond. 1877.

HORN (Dr. George H.), A List of Coleoptera collected by G. Thomas in Eastern Colorado and North-Eastern New Mexico during the Survey of 1868. [Report of the U. S. Geological Survey of Wyoming. 8vo. Washington, 1872.]

Coleoptera. [Report of the U. S. Geological Survey of Montana. 8vo. Washington, 1872.]

The Rhyncophora of America. *See* "LE CONTE and HORN."

Report on Insects introduced by means of International Exhibition. *See* "LE CONTE, HORN and LEIDY."

JOLY (Dr. N.), Etudes sur l'Embryogénie des Ephéméres notamment chez la *Palingenia virgo*. 8vo. Toulouse, 1876 (?)

JOLY (Dr. N.) et JOLY (E.), Contributions à l'Histoire Naturelle et à l'Anatomie des Ephémérines. 8vo. Montpellier, 1876.

KATTER (Dr. F.), Entomologische Nachrichten. 2 Jahrg. & 3 Jahrg. Hft 1. Putbus, 1876 & 1877

LE CONTE (Dr. John L.), Tabular Synopsis of the Rhyncophoraof America. 8vo. 1877.

On the Affinities of Hypocephalus. 8vo. Philadelphia, 1876.

Report upon New Species of Coleoptera collected by the Expedition for Geological Surveys west of the 100th meridian. 8vo. Washington, 1876.

LE CONTE (Dr. John L.) and HORN (Dr. G. H.), The Rhyncophora of America. 8vo. Philadelphia, 1876.

LE CONTE (Dr. John L.), HORN (Dr. G. H.), and LEIDY (Joseph), Report on Insects introduced by means of the International Exhibition. 8vo. Philadelphia, 1876.

LICHTENSTEIN (Jules), of Montpellier, Notes pour servir à l'histoire des Insectes du genre Phylloxera. 8vo. Bruxelles, 1877.

LUBBOCK, Bart. (Sir John), Observations on the Habits of Ants, Bees and Wasps. Part IV. 8vo. London, 1877.

McLACHLAN (Robert), A Monographic Revision and Synopsis of the Trichoptera of the European Fauna. Part VI. 8vo. London and Berlin, 1877.

MAIGNEN (Prosper Auguste), Observations on the *Phylloxera vastatrix*, with Illustrations of the Transformations, taken from the "Tableau Biologique du Phylloxera," offert au Congrés de Bordeaux. London, 1876.

MENGE (A.), Ueber ein Rhipidopteren und einige andere in Bernstein eingeschlossene tiere. Danzig, 1866.

MURRAY (Andrew), Economic Entomology (Aptera); being the first volume of a Series entitled "South Kensington Museum Science Hand-Books." 8vo. London, 1877.

Digitized by Google

Naturalist (The). *See* "Societies (HUDDERSFIELD)."

Nature. Nos. 371 to 422 (7 Dec. 1876, to 29 Nov. 1877).

NEWMAN (Edward), Memoir of the Life and Works of E. Newman. By his Son. 8vo. London, 1876.

OBERTHÜR (Charles), Etudes d'Entomologie d'Insectes Nouveaux ou peu connus. Livr. 1 & 2. 4to. Rennes, 1876.

I. Etudes sur la Faune des Lépidoptères de l'Algérie.

II. Espèces nouvelles des Lépidoptères recueillis en Chine, par M. l'Abbé A. David.

OLIVIER (Ernest), Le Doryphora (Leptinotarsa) decemlineata. 8vo. Moulins (Allier).

OLIVIERA (Manuel Paulo d'), Mélanges Entomologiques sur les Insectes de Portugal. 8vo. Coimbre, 1876.

ORMEROD (E. A.), Notes for Observations on Injurious Insects.

OSTEN-SACKEN (C. R.), Western Diptera. Descriptions of New Genera and Species of Diptera from the Region West of the Misissippi, and especially from California. 8vo. Washington, 1877.

Notes on some Diptera from the Island Guadaloupe (Pacific Ocean) collected by Mr. E. Palmer. 8vo. Boston, 1876.

A List of the North American Syrphidæ. 8vo. Buffalo (N. Y.), 1876.

Prodrome of a Monograph of the Tabanidæ of the United States. Parts 1 & 2. 4to. Boston, 1876.

Report on the Collection of Diptera made in portions of Colorado and Arizona during the year 1873.

Report on the Diptera collected by Lieut. W. L. Carpenter in Colorado. *See* "CARPENTER (W. L.)"

Notice on the Galls collected by Lieut. W. L. Carpenter in Colorado. *See* "CARPENTER (W. L.)"

PACKARD, Jun. (Dr. A. S.), Mayer's Ontogeny and Philogeny of Insects.

A Century's Progress in American Zoology. [Reprinted from the 'American Naturalist,' October, 1876.]

On a new Cave Fauna in Utah, and on new Phyllopod Crustacea from the West. 8vo. Washington, 1877.

Geographical Distribution of the Moths of Colorado. *See* "CARPENTER (W. L.)"

Report of the Myriopods in Colorado. "

Description of a Lernæan Crustacean. "

Synopsis of the Fresh-water Phyllopod Crustacea. "

PALMEN (Dr. J. A.), Zur Morphologie des Tracheensystems. 8vo. Helsingfors. 1877.

PASCOE (Francis P.), On Zoological Classification. London, 1877.

PLATEAU (Félix), Les Voyages des Naturalistes Belges. 8vo. Bruxelles, 1876.

L'Instinct des Insectes peut-il être mis en defaut par des fleurs artificielles?

REUTER (Edm.), Neue Clavicornen.

RILEY (Charles V.), The Ninth Annual Report of the Noxious, Beneficial and other Insects of the State of Missouri. 8vo. Jefferson City, 1877.

The Locust Plague in the United States, being more particularly a Treatise on the Rocky Mountain Locust. 8vo. Chicago, 1877.

SAUSSURE (Henri de), Mission Scientifique au Mexique, pp. 133 à 292. Planches 5 & 6. Paris.

Mélanges Orthoptérologiques, 5ème fasc. 4to. Genève, Bale & Lyon, 1877.

SCHMANKEWITSCH (Wladimir), Zur Kenntniss des Einflusses der äusseren Lebensbedingungen auf die Organisation der Thiere.

Digitized by Google

Scottish Naturalist. Edited by Dr. F. Buchanan White. Nos. IX. to XXVIII.

Scudder (Samuel H.), Insects of the Tertiary Beds at Quesnel (British Columbia).

Brief Synopsis of North American Earwigs, with an Appendix on the Fossil Species.

List of the Orthoptera collected by Dr. A. S. Packard in Colorado and the neighbouring Territories during the Summer of 1875.

Notice of a small Collection of Butterflies made by Dr. A. S. Packard in Colorado and Utah in 1875.

The Relationship of the Early Spring Blues. 8vo. London (Ontario), 1876.

Synonymic List of the Butterflies of North America north of Mexico. Part II. Rurales.

A Cosmopolitan Butterfly (a Reprint). 8vo. Cambridge, 1876.

The Mode in which Cockroaches and Earwigs fold their Wings.

Synoptical Table for determining North American Insects.

Entomological Notes. No. 5. 8vo. Boston, 1876.

Remarks on some Remains of Insects occurring in Carboniferous Shale at Cape Breton.

Notice of a small Collection of Butterflies, by Mr. Roland Thaxter, on Cape Breton Island.

A Century of Orthoptera. Decade V. Forficulariæ (Exotic).
„ „ VI. „ (N. American).

Description of Three Species of Labia from the Southern United States.

Orthoptera from the Island of Guadalupe.

Critical and Historical Notes on Forficulariæ; including Descriptions of New Generic Forms, and an Alphabetical Synonymic List of the Described Species.

A Brief Comparison of the Butterfly Fauna of Europe and Eastern North America, with Hints concerning the derivation of the latter. 8vo. Cambridge (Mass.), 1877.

Antigeny, or Sexual Dimorphism in Butterflies.

On the first discovered traces of Fossil Insects in the American Tertiaries, and on two new Carabidæ from the Interglacial Deposits of Scarboro' Heights, near Toronto, Canada.

On the Classification of Butterflies, with special reference to the Position of the Equites or Swallow-tails. 8vo. Philadelphia, 1877.

Selys-Longchamps (E. de), Synopsis des Agrionines. 12mo. Bruxelles, 1876-77.

Siebke (H.) *See* "Enumeratio," &c.

Siebold (C. von), Ueber Helicopsyche als eine der Schweiz. Insecten fauna angehörende Phryganide erkannt. Schaffhausen, 1876.

Ueber die in München gezüchtete Artemia fertilis aus dem grossen Salzsee von Utah. 8vo. Basel, 1877.

Smith (Frederick), Catalogue of British Hymenoptera. 2nd edition. Part I. Andrenidæ and Apidæ. 8vo. London, 1876.

Smith (S. J.), Report on the Amphipod Crustaceans. *See* "Carpenter (W. L.)"

Societies (Transactions of Learned).

(Boston, U. S.), Proceedings of the Boston Society of Natural History. Vol. XVIII. Parts 3 & 4.

Memoirs of the Boston Society of Natural History. Vol. II. Part IV. No. 5.

(Brünn), Verhandlungen der naturforschenden Vereines in Brünn. Band XIV. 1875.

(Brussels), Annales de la Société Entomologique de Belgique. Tom. XIX., Fasc. 2 & 3, 1876; and XX., Fasc. 1, 1877.

(Buffalo, N. Y.), Bulletin of the Buffalo Society of Natural Sciences. Vol. III. No. 4.

Digitized by Google

Societies (Transactions of Learned).

(CAMBRIDGE, Mass., U.S.), Psyche, Organ of the Cambridge Entomological Club. Vol. II. Nos. 33 to 38.

(DAVENPORT, Iowa, U.S.), Proceedings of the Davenport Academy of Natural Sciences. Vol. I. 1867-76.

(FLORENCE), Bulletino della Società Entomologica Italiana. Anno 8vo, Trimestre 4, 1876; Anno 9o. Trim. 1—3, 1877.

(GENEVA), Mémoires de la Société de Physique et d'Histoire Naturelle de Genève. Tome XXIV., 2de Partie, 1875—6; Tome XXV., 1ère Partie, 1877.

(GENOA), Annali del Museo Civico di Storia Naturale di Genova. Vols. IV—VIII. 1873—76.

(HAGUE), Tijdschrift voor Entomologie. 20 Deel. Afl. 1—4. s'Gravenhage, 1876—77.

(HELSINGFORS), Notiser ur Sallskapets pro Fauna et Flora Fennica Förhandlingar. 13 & 14 Haftet.

(HUDDERSFIELD), The Naturalist, Journal of the Yorkshire Naturalists' Union. Nos. XVIII. to XXIX. 1877.

(LEEDS), The Seventh Annual Report of the Leeds Naturalists' Club. 1876—77.

(LONDON), Proceedings of the Royal Society. Nos. 175 to 183.

Transactions of the Linnean Society (Second Series). Zoology. Vol. I. Parts 4 to 6.

Journal of the Linnean Society (Zoology). Vol. XIII. Nos. 66 to 73.

Proceedings of the Scientific Meetings of the Zoological Society, 1876. Part IV.; 1877, Parts I. & II.

Journal of the Quekett Microscopical Club. No. 34.

Journal of the Royal Agricultural Society of England. (Second Series). Vol. XIII.

(MOSCOW), Bulletin de la Société Impériale des Naturalistes de Moscou. 1876, Nos. 2 to 4. 1877, Nos. 1 & 2.

(PARIS), Annales de la Société Entomologique de France. 4ème Serie. Tome 10e. (Partie Supplementaire, Famille des Eucnémides. 4ème Cahier).

Annales de la Société Entomologique de France. 5ème Serie. Tomes 4 & 5.

(PHILADELPHIA), Transactions of the American Entomological Society. Vol. V., Nos. 3 & 4; Vol. VI., Nos. 1 & 2.

Annual Report of the Board of Regents of the Smithsonian Institution for 1876.

(RIO JANEIRO), Archivos do Museu Nacional do Rio Janeiro. Vol. I. Trimestres 1—3.

(ROME), Atti della R. Accademia dei Lincei. Serie terza. Transunti. Vol. I., Fasc. 1—7. 1876—77.

(ST. PETERSBURG), Horæ Societatis Entomologicæ Rossicæ. T. XII. Nos. 1—4.

(SCHAFFHAUSEN), Mittheilungen der Schweizerischen Entomologischen Gesellschaft. Vol. IV., Heft Nro. 10, 1877; Vol. V., Heft Nro. 3, 4.

(STETTIN), Entomologische Zeitung.

37 Jahrg. Nro. 10—12.

38 Jahrg. Nro. 1—12.

(SYDNEY), Proceedings of the Linnean Society of N.S. Wales. Vol. I., Part 4; Vol. II., Part 1.

(TORONTO), Annual Report of the Entomological Society of the Province of Ontario. 1876.

(TOULOUSE), Bulletin de la Société d'histoire naturelle de Toulouse. 10e année 1875-76, et 11e année Fasc. I., 1877.

(VIENNA), Verhandlungen der k. k. Zoologisch-botanischen Gesellschaft in Wien. XXVI. Band.

Digitized by Google

Societies (Transactions of Learned).

(Warwick), Proceedings of the Warwickshire Field Club.

(Washington), Bulletin of the United States Entomological Commission. No. 1. Destruction of the Young or Unfledged Locust. No. 2. On the Natural History of the Rocky Mountain Locust.

Reports of the United States Geological Surveys, 1870, 1871 and 1874.

(Watford & Hertford), Transactions of the Watford Natural History Society and Hertfordshire Field Club. Vol. I. Parts 3 to 6.

Thomas (Cyrus), A List and Descriptions of New Species of Orthoptera [with remarks on the *Caloptenus spretus*, or Hateful Grasshopper.] [Report of the United States Geological Survey of Wyoming. 8vo. Washington, 1872.]

Notes on the Saltatorial Orthoptera of the Rocky Mountain Regions. [Report of the U. S. Geological Survey of Montana. 8vo. Washington, 1872.]

Thomson (C. G.), Opuscula Entomologica. Fasciculi 5 et 6. 8vo. Lund, 1873—74.

Uhler (P. R.), A List of Hemiptera collected in Eastern Colorado and North Eastern New Mexico, during the Expedition of 1869. [Report of the U. S. Geological Survey of Wyoming. 8vo. Washington, 1872.]

Notices of the Hemiptera of the Western Territories of the United States, chiefly from the Surveys of Dr. F. V. Hayden. [Report of the U. S. Geological Survey of Montana. 8vo. Washington, 1872.]

Ulke (Henry), List of Coleoptera in Colorado. *See* "Carpenter (W. L.)"

Vollenhoven (S. C. Snellen von), Sepp's Nederlandsche Insecten. Nos. 37 to 46. 4to. s'Gravenhage, 1875—77.

Pinacographia, Illustrations of more than 1000 Species of North-West European Ichneumonidæ sensu Linnæano. Afl. 4 & 5. 4to. s'Gravenhage, 1876.

Walker (Rev. Francis A.), Voices from many Lands.

A History of the Parish of Dry Drayton, in the Rural Deanery of Chesterton, County of Cambridge and Diocese of Ely.

Wehncke (—), Neue Dytisciden.

Wood-Mason (James), Description of a new Genus of Mantidæ (*Fischeria laticeps*).

On the Mode in which the Young of the New Zealand *Astacidæ* attach themselves to the Mother. 1876.

Descriptions of new Species of Blattidæ belonging to the Genus *Panesthia*.

Descriptions of new Species of Mantidæ with Pointed Eyes.

On the Final Stage in the Development of the Organs of Flight in the Homomorphic Insecta.

The Vates Ashmolianus of Westwood, the type of a new Genus of Mantidæ.

Descriptions of two new Genera and Species of Indian Mantidæ.

On a small Collection of Orthopterous Insects of the Families Phasmidæ and Mantidæ from Australia and New Britain.

Description of a new Species of Phasmidæ from India.

Zoological Record for 1875.

Zoologist (The) for 1877.

Digitized by Google

Digitized by Google

PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY OF LONDON

FOR

1877.

February 7.

Professor Westwood, M.A., F.L.S., President, in the chair.

Election of a Subscriber.

William Denison Roebuck, Esq., of Leeds, Hon. Sec. of the West Riding Consolidated Naturalists' Society and of the Leeds Natural History Society, was balloted for and elected a Subscriber.

The President nominated Messrs. J. W. Douglas, J. W. Dunning and Henry T. Stainton as Vice-Presidents for the ensuing year.

The President then delivered the Address, which he was prevented from delivering at the Annual Meeting, on the progress of Entomology during the past year, and which was ordered to be printed.

Exhibitions, &c.

Mr. F. Bond (on behalf of Mr. Cooke, of Brighton) exhibited another specimen of the North-American butterfly, *Danais Archippus*, taken during the second week of September last by Mr. Alford Wood, of New Close, Keymer, Sussex, flying over a field of clover near Hassock's Gate. This was the third specimen recorded as having been taken in this country; the first having been captured near Neath on the 6th September, and the second near Hayward's Heath on the 17th October, 1876, and recorded in the 'Entomologist's Monthly Magazine' for October, and in 'The Entomologist' for December, 1876.

The President brought for exhibition a specimen of the singular butterfly *Bhutanitis Lidderdalii*, Atkinson, from Bhotan. He also read a letter which he had received from Baron v. Osten-Sacken, referring to his paper on the genus *Systropus*, published in the last part of the 'Transactions' of

Digitized by Google

this Society, in which he had stated that a species received from Natal (*S. crudelis*) had been bred from a cocoon resembling that of *Limacodes*, found on a tree of the genus *Mimosa*. The letter referred the President to a paper by Benj. D. Walsh in the 'Proceedings of the Boston Society of Natural History' (vol. ix., p. 300, 1864), in which he relates that he had bred a dipteron from a cocoon of *Limacodes hyalinus*. This dipteron, which he had communicated to Baron Osten-Sacken, proved to be the common North-American *Systropus* (*S. macer*, Loew), and was a remarkable instance of community of habit among insects of the same genus in far distant regions.

The President had also been informed by M. Ernest Olivier, of Moulin, who had recently visited Pompeii, that he had observed large numbers of *Bombylii* flying in company with a bee of which he had forwarded a specimen, but this proved to be an *Anthophora* (probably *A. nigrocincta*), and not an *Andrena*, like those described in his paper in the last part of the 'Transactions' ("Notæ Dipterologicæ," No. 1).

Mr. M'Lachlan exhibited a case of a Lepidopterous larva sent by Dr. Kirk from Zanzibar, who had found it on a species of *Mimosa*. He considered it to be allied, probably, to *Psyche* and *Oiketicus*, and was remarkable on account of its form, which bore a striking resemblance to that of a flattened *Helix*. It appeared to be constructed of a substance resembling *papier maché*, with a smooth whitish external coating.

Mr. C. O. Waterhouse exhibited varieties of British Lepidoptera, viz., *Chrysophanus phlæas*, *Polyommatus Adonis*, *P. Alexis* and *Agrotis exclamationis*.

Dr. F. Buchanan White forwarded to the Society the following account of a case of "Pruritus from an Unusual Cause," by Dr. Tilbury Fox, extracted from the 'Medical Examiner' of 21st December, 1876:—

"At the end of July, 1876, a gentleman resident in the Eastern Counties noticed on the eyelid of his infant a small red speck, which on examination with a hand-microscope proved to be a living parasite, partially imbedded in the skin. Several days subsequently his wife was greatly annoyed by pruritus, and her neck and chest were found studded here and there with these little red specks, which at first sight were thought to be "petechiæ," but turned out to be insects. They could be readily extracted with a pin. In the attempt to discover the source whence the parasites came, a pet pug dog was examined, and then collections of these parasites on the nose and between the eyes—where, in fact, the hair was least thick—were discovered. During August the little red visitors caused excessive annoyance to the servants and everyone in the house, defying all remedial measures, though some members of the household were very much less affected than others. Remove them as you would, the next day a fresh supply appeared, and the

Digitized by Google

insects were found on the arms of the infant as well as the face, on the back, neck and chest, and even the nipples of the adults. A favourite long-haired French cat was examined, because one of the family after nursing it was greatly annoyed, and the ears were found infested. The hair fell off, leaving bald patches where the parasites were congregated on the dog and the cat. In the middle of August the animals were shut up, isolated, and regularly dressed with equal parts of sulphurous acid and glycerine, and the plague began to diminish at once. The members of the household had tried citrine ointment, compound sulphur ointment, detergent solution of tar, &c.; but still the nuisance continued in some degree, and a second cat was found affected. But when all the animals were shut out of the house the mischief did not cease. There was some doubt and difference of opinion with regard to the exact species of the parasite. A specimen was submitted to my friend Dr. Cobbold, and he pronounced it to be *Trombidium*, or garden mite, which lives on plants. It is closely related to the true mites, the itch-insect, the little red "spider" of hot-houses, and the well-known *Leptus autumnalis*, or "harvest-bug." The annoying pruritus about the legs produced by the latter at the end of the summer, after a walk in the fields, &c., is well known to every one; and Dr. Heiberg has lately recorded that the nuisance assumed an epidemic form in a village in Denmark. In the present case the pruritus was chiefly around the neck and shoulders, and several parasites were removed from the eyelids. The plants in the garden were not examined to see if plant-mites were very abundant there, as this exact source was not suspected at the time. There can be little doubt, I think, that the original source must have been certain plants in the garden; that the house pets, who were undoubtedly first affected, were agents in the conveyance of the main portion of the parasites to the human members of the family, but not exclusively, the probability being that many of the people, especially after the pet cats and dog were excluded from the house, managed to be infected directly from the original source."

Papers read.

"Notes on the African *Saturnidæ* in the Collection of the Royal Dublin Society." By W. F. Kirby.

"Descriptions of new Genera and Species of Phytophagous Beetles belonging to the Family *Cryptocephalidæ*, together with Diagnoses and Remarks on previously described Genera." By Joseph S. Baly, F.L.S.

"Descriptions of new Species of Phytophagous Beetles belonging to the Family *Eumolpidæ*, and a Monograph of the Genus *Eumolpus*." By Joseph S. Baly, F.L.S., &c.

Digitized by Google

March 7, 1877.

J. W. Dunning, Esq., M.A., F.L.S., Vice-President, in the chair.

Exhibitions, &c.

Mr. Douglas exhibited a specimen of the Longicorn, *Monohammus sutor*, brought to him alive, having been captured in a garden in the Camden Road. Also a melanic variety of *Orthosia suspecta*, taken at Dunkeld.

Mr. Hudd exhibited varieties of British Lepidoptera taken near Bristol and in South Wales. Amongst them were *Sphinx ligustri*, *Lycæna Alexis*, and *Boarmia repandata*, the latter a black variety.

Mr. Champion exhibited specimens of *Cardiophorus rufipes*, a species new to Britain, taken by Mr. J. Dunsmore near Paisley; also a British example of *Aphodius scrofa*, from the collection of Mr. Dunsmore, who unfortunately had no note of its locality.

The Secretary exhibited a specimen of an Isopod Crustacean, which had been forwarded to him by Mr. J. M. Wills, Surgeon S.S. 'City of Canterbury,' who stated that it was found occasionally parasitic on the flying fish, and generally close to the pectoral fins.

Mr. Douglas read the following extract from a letter received from Dr. Sahlberg from Helsingfors:—

"As you have already heard, I went on an entomological excursion to Yenisei. My plan was to meet Professor Nordenskjöld at the mouth of the river, and to return per steamer over the Kara Sea. I did not succeed, and therefore had to travel back through Siberia; still I have brought a mass of insects with me from the extreme north of Siberia, especially Coleoptera and Hemiptera, and now I am busy getting them into order. The insect fauna of Arctic Siberia agrees with that of Lapland, and I had the pleasure to find several species which I had formerly discovered in the north of my own country; for example, among Hemiptera, *Platypsallus acanthioides* and *Bathysmatophorus Reuteri*, the last being the most frequent of the *Cicadaria* in the district. In the neighbourhood of the River Yenisei, in places which are yearly flooded there were to be found many species strange to Europe, but not very many new.

"I have just looked through my Siberian collection of Hemiptera-Heteroptera, and as most of these were collected in the extreme north, the lot is rather poor, and consists of less than one hundred species, of which fourteen were new—viz., one *Aradus*, one *Calocoris*, two *Orthotylus*, one *Orthops*, one *Pachytoma*, one *Anthocoris*, one *Acompocoris*, five *Salda*, one *Corixa*. I am interested most in the *Salda* species, which were large and

Digitized by Google

fine, and discovered in the extreme North (69°—70° 20′), in Tundra territory (*extra limites arborum*).

"I have just received the commission from the Nordenskjöld Yenisei Expedition (which consists of four naturalists, amongst whom is Philip Trybom, an entomologist), to work at the collection of Coleoptera and Hemiptera, which, however, is still in Siberia. I shall therefore not publish anything until I have looked through it, although I have the descriptions of the new species ready. Pending the appearance of Fieber's 'European Cicadaria,' I shall begin the Coleoptera."

Paper read.

The Secretary read a paper by Mr. W. L. Distant, "On the Geographical Distribution of *Danais archippus*." The author remarked on the migration of the butterfly from North America (its original home) eastward to Europe and the Azores and westward to the South Sea Islands and Australia, and attributed the "means of dispersal" to "winds, currents, and the agency of man." After the reading of the paper a discussion ensued, in which considerable doubt was expressed as to the probability of insects being conveyed on floating timber by the agency of the Gulf Stream or other currents.

April 4, 1877.

Professor Westwood, M.A., F.L.S., President, in the chair.

Election of Members.

Mr. George Harding, of Stapleton, Bristol; Mr. Charles Adolphus Briggs, of 55, Lincoln's Inn Fields; and Mr. John T. Carrington, of the Royal Aquarium, Westminster, were balloted for and elected Ordinary Members.

Mr. E. Howard Birchall, Mr. T. D. Gibson Carmichael, Dr. Edward Capron, and Mr. Valentine Cluse were balloted for and elected Subscribers.

Exhibitions, &c.

The Secretary exhibited a collection of fine species of Lepidoptera from Siam (about twenty miles from Bangkok), forwarded to him by Mr. R. Garner, of Stoke-upon-Trent.

Mr. M'Lachlan exhibited a specimen of *Ophideres materna*, a brightly-coloured exotic species of *Noctuidæ*, given to him by Mr. R. H. Scott, of the Meteorological Office, with a note to the effect that it was taken at sea

Digitized by Google

in lat. 25° 24′ S., long. 62° 10′ E. (the nearest land being the island of Mauritius, about 360 miles distant), by Captain Raeburn, of the ship 'Airlie.' The moth is a common Indian species, but is found also in Africa. A specimen was long ago received from Brazil, and Mr. Grote had recently noticed its occurrence in Florida.

Mr. M'Lachlan also exhibited a cocoon and pupæ of a species of *Cetoniidæ* (probably *Diplognathus silaceus*) from Cameroons, sent to Mr. Rutherford. The cocoon appeared to be formed of dark brown earth, but attached thickly to the exterior were oval, slightly flattened, deep black, hard bodies (each nearly five lines long by two broad), which he thought were probably the excrement of some rodent quadruped.

Mr. Champion exhibited *Stenus Kiesenwetteri* (hitherto only found in this country at Wimbledon), *Gymnusa brevicollis*, *Bembidium nigricorne*, and *Plociomerus luridus*, all from Chobham; also *Philonthus cicatricosus* from Shoreham.

Mr. Howard Vaughan exhibited (on behalf of Mr. Bidwell) a specimen of *Notodonta trilophus*, taken about the year 1867 at Ipswich by a lamplighter. Mr. Douglas had captured some years ago at St. Osyth, in Essex, what was hitherto the only authentic British specimen of this insect.

The President read some interesting remarks from a letter he had received from Mr. B. G. Cole respecting some specimens of *Ephyra punctaria* which he had bred from eggs laid by the same female, the greater number of which emerged from the pupæ in July (as the spotted variety), while the remainder appeared in May, in all respects resembling the mother. He repeated the experiment in 1876 with similar results; all but one pupa from a batch of eggs laid in May appeared in July as the spotted form (males and females), the single exception remaining still in pupa, which it was presumed would appear during the coming May in the vernal dress. In this latter case he had reared a second brood of larvæ from eggs laid by some of the July females, all of which were now in the chrysalis state. Mr. Cole added—

"May not the above be considered a case of 'season-dimorphism' analogous to that occurring in *Pieris*, *Araschnia*, *Selenia*, &c., as investigated by Dr. Weismann, a slow process of development during the winter being necessary for the production of the May form (which may be considered the type), whilst if the development of the pupa is hastened by the heat (and light?) of summer, the smaller and less perfect individuals are the result. Referring to the similar case of *Selenia illustraria*, Dr. Knaggs (Entom. Mo. Mag., vol. iii. p. 238) remarks as follows:—'It is pretty well known that in the natural sequence *illustraria* reproduces itself in the form of *delunaria* and *vice versâ*. But what I assert is, that whenever (whether at large, owing to exceptionally hot or long summer seasons, or in captivity from warmth, assisted perhaps by what Mr. Crewe has happily termed

Digitized by Google

"feeding up quickly") the completion of the pupal stage is accelerated, then *delunaria* produces *delunaria*, not *illustraria*. Further, it is my belief that the converse will be found to hold good, *viz.* that should the completion of the pupal stage be retarded either by cold seasons or climates in a state of nature, or artificially by aid of an ice-well, *illustraria*, not *delunaria*, would be found to result from *illustraria*.' And again (*loc. cit.* p. 256) he puts it thus:—'If *I.* = *illustraria*, *D.* = *delunaria*, and — = winter; then if there be but one brood in the year the sequence will be *I.* — *I.* — *I.*, and so on; if two broods, *I. D.* — *I. D.* — *I. D.*, and so on; if three broods, *I. D. D.* — *I. D. D.*, and so on.'

"I have not yet tried the effect of artificial retardation on the pupæ of *Ephyra*, but intend to do so when opportunity offers. My experiment shows that the effect of natural retardation over the winter months is to produce the type whatever may be the form of the parents; and that such natural retardation does usually (? always) occur in double-brooded species I believe to be true from my experience in breeding various insects. Remembering that the summer broods of season-dimorphic species are smaller, and apparently vitally weaker than the spring ones, and that it is from the former that the latter are usually descended, may we not assume that the provision by which some few of the direct offspring of the spring forms are preserved through the winter in the pupal state, and so are enabled to pair with the offspring of the summer form, is of advantage to the species, in affording a 'cross' between individuals which have developed under very different conditions? A similar benefit may be derived in the commonly observed case of individual pupæ of single-brooded moths (*e.g. Eriogaster* and many *Notodontidæ*) remaining two, three, or more years in that stage, and then eventually making their appearance at the proper season with the ordinary flight of the species.

"As bearing on the above suggestion, I may refer to what occurs in those single-brooded moths (*Sphinx Convolvuli, Acherontia Atropos*, &c.), which sometimes appear abnormally from the pupa before the winter hybernation, or which by 'forcing' have been artificially so developed. It has been stated, I believe, in most such cases in which an anatomical examination has been made, that the ovaries, &c., were found in an abortive or rudimentary condition. This goes to show that a long period of quiescence is necessary to perfect these delicate and highly specialized organs, and by a parity of reasoning it may perhaps be assumed that those pupæ which remain longest in that stage will (*ceteris paribus*) produce the most highly developed and vitalized imagos."

Papers read.

The President read "Notes upon a Strepsipterous Insect parasitic on an Exotic Species of Homoptera (*Epora subtilis*, Walk.) from Sarawak,"

Digitized by Google

accompanied by drawings illustrating the metamorphosis. He also read Notes on the Genus *Prosopistoma*, especially with regard to the species from Madagascar described by Latreille, of which he exhibited the types.

Mr. Cameron communicated a paper on East Indian *Tenthredinidæ*; and Mr. Butler a paper on the Lepidoptera of the Amazon Valley, collected by Dr. Trail in the years 1873—75.

Mr. Baly communicated "Descriptions of new Species of *Halticidæ*," and Mr. C. O. Waterhouse, "A Monograph of the Australian Species of the Coleopterous Family *Lycidæ*."

Mr. Frederick Smith read "Descriptions of new Species of the Genera *Pseudomyrma* and *Tetraponera* belonging to the Family *Myrmicidæ*.

May 2, 1877.

J. W. Dunning, Esq., M.A., F.L.S., Vice-President, in the chair.

Election of Members.

Messrs. H. J. Adams, Charlestrom Adams (Chase Park, Enfield), and J. W. Slater (2, Tamworth Terrace, Hornsey Road) were balloted for and elected Members of the Society.

Exhibitions.

Mr. Jenner Weir exhibited a large silken cocoon from the Cape of Good Hope, supposed to be a spider's nest. On being opened it was found to contain, among other *débris*, a number of skins of small spiders and remains of the elytra of a beetle of the genus *Moluris*. Mr. Weir also exhibited a spider's nest from Montserrat.

Mr. F. Grut exhibited a large species of *Chelifer* from North Spain.

Sir Sidney Saunders exhibited a spider, *Atypus sulzeri*, taken on Hampstead Heath; it was found inhabiting tubes concealed under bushes in hedges. These tubes project about four inches above the ground and extend about ten inches beneath the surface. Mr. Jenner Weir remarked that he had observed the same or an allied species on the South Downs.

Mr. Champion exhibited a series of *Alaus Pareyssi* from Thaso Island.

Mr. C. O. Waterhouse exhibited specimens of *Dohrnia miranda* (Newm.), a Heteromerous beetle from Tasmania; also *Creophilus erythrocephalus* and *Forficula erythrocephala* from the same region, these two last insects having some resemblance to each other. Mr. Bates suggested that the resemblance might possibly be accounted for by the two insects mimicking some other species.

Digitized by Google

Papers read.

Sir Sidney Saunders communicated a paper "On the Adult Larvæ of *Stylopidæ* and their Puparia," and exhibited specimens in illustration.

Mr. H. W. Bates communicated a paper "On *Ceratorrhina quadrimaculata* (Fab.), and Descriptions of Two new Allied Species." Specimens of the new species and also of *C. Morgani* (Westw.) were exhibited by the author.

Mr. Dunning urged upon authors of papers the advisability of exhibiting specimens of the new species described in their communications in all cases where possible.

June 6, 1877.

J. W. Dunning, Esq., M.A., F.L.S., Vice-President, in the chair.

Election of a Foreign Member.

M. Réné Oberthür, Rennes, France, was balloted for and elected a Foreign Member.

Exhibitions, &c.

Mr. J. W. Douglas exhibited the following insects:—

Psylla sylvicola, Leth. On birch trees, Sevenoaks, July.
„ **betulæ*, Linn. On birch trees, Dunkeld, August.
„ *pruni*, Scop. On fir trees, Addington Hills, October.
**Psylla peregrina*, Först. On mountain ash, Perth, August.
„ *costalis*, Flor. On larch, Edinburgh, August.
„ *spartiophila*, Först. On broom, Plumstead, June.
„ *simulans*, Först., and **P. pyricola*, Först. On pear trees, Perth and Roslyn, August.
„ *cratægi*, Först. On pear trees, Roslyn, August.
„ **Scotti*, Löw. On fir trees, Addington Hills, October.
„ *hippophaës*, Först. On *Hippophaë rhamnoides*, Folkestone, August.
Trioza urticæ, Linn., *T. hæmotodes*, Först., and *T. albiventris*, Först. On fir trees, Addington Hills, October.
„ *Walkeri*, Först. On buckthorn, Dartford, October.
Aphalara polygoni, Först. On *Rumex acetosella*, Sevenoaks, July; and on fir trees, Addington Hills, October.

In all sixteen species of *Psyllidæ* taken by him during the latter half of 1876, whereof four (*) are new to Britain. Mr. Douglas called attention to

Digitized by Google

the wide field the *Psyllidæ* offered for the discovery of new species and observation of economy, the variety in the latter being very great, some species rolling or deforming leaves, some exuding a waxy secretion, and others living free. The natural history of many species is quite unknown, and the rearing of any from the egg or larva to the perfect state was commended to the attention of entomologists, especially of those who have reared Lepidoptera, as being equally interesting with insects of that order, and furnishing an area for investigation as yet but little occupied.

Mr. F. Grut exhibited a white downy nest from Jamaica, supposed to be produced by some insect.

Mr. H. Goss exhibited a dark variety of *Cleora glabraria*.

Mr. C. O. Waterhouse exhibited a new species of dragon-fly from Borneo, belonging to the genus *Gynacantha*, which he proposed to call *G. plagiata*. It differed from all its congeners, not only in its great size, but in the unusual colouring of the wings, which were hyaline, with the whole anterior border as far as the stigma broadly margined with pitchy brown, and with a large patch of the same colour, only darker, across each wing near the apex; this patch on the hind wings extended a little along the posterior border. The total expanse of the wings was 6¼ inches; the length of the posterior wing, 3⅞ inches. The specimen was a female.

The Secretary read a circular from Dr. Buchanan White, of Perth, asking entomologists to assist him with specimens of Hemiptera (especially exotic), as he was engaged in working out that order of insects.

Dr. Sharp communicated the following note:—

"At the time Dr. Leconte was engaged in working out the classification of the Rhynchophorous series of Coleoptera, I sent to him some New Zealand species which appeared to me to be of interest, and he has now communicated to me his opinions on these forms. As Dr. Leconte's highly important memoir is now in the hands of entomologists, it is but fair that his views as to these insects should be made known to those who are likely to find them of assistance. 'I have looked,' he says, 'several times at the New Zealand *Rhynchophora* you sent me, and find them so different from our North American types that my opinion without the study of very extensive series of genera from other countries would probably have but little value. Still I will say what I think will be confirmed with more comparisons. *Rhadinosomus* is a subfamily of *Curculionidæ* of equal systematic value with *Sitonidæ* and *Alophidæ* of my system, and indicates an affinity towards *Bremthidæ*. Lacordaire has put it in an entirely wrong position, for the mentum is small, the gular peduncle well developed, the maxillæ exposed, and the mandibles without scar and emarginate at tip. *Psepholax* is not a Cryptorhynch, as indicated by Lacordaire, but a Scolytid of the tribe *Hylurgini*, as is clearly proved by the last ventral segment surrounding the

Digitized by Google

dorsal at the tip on the upper surface; the beak and antennæ are also more like *Hylastes*; in fact, the genus does not differ greatly from *Scierus*, Lec., except by the front and hind tibiæ not being toothed. *Nyxetes* indicates a tribe belonging to the Anthonomine type. *Pactola* and *Stephanorhynchus* are entirely anomalous; they seem to have the same relation to the Erirhine and Anthonomine types that *Tachygonus* bears to the Cryptorhynchs and Ceuthorhynchs. *Xenocnema* seems to be a new group of the tribe *Hylurgini*, allied to *Hylastes*, but making a still nearer approach to the Cossonide *Stenoscelis*. *Anthribus inflatus* and *atomus* belong to a tribe allied to (perhaps not different from) *Notioxeni*.'"

Mr. Pascoe said that some of the genera mentioned were his own, or had been treated by him, which Dr. Leconte had apparently overlooked. *Rhadinosomus*, as a phanerognathous genus, he had been compelled, much as he disliked interfering with a classification generally adopted, to remove to a group apart, and allied, as he thought, to *Rhinaria* (through such genera as *Euthyphasis*, *Acalonoma* and *Ethemaia*). *Psepholax*, too, could be traced through certain forms (as *Empleurus*, *Oreda*, and others, to *Strongylopterus*), connecting it with the normal *Curculionidæ*. Very little, he thought, could be done satisfactorily without reference to large collections. Classification, to be natural, should depend more on a comparison of forms than on merely technical characters, which, when derived from a limited series, were often misleading. The *Rhynchophora* of the United States were of a remarkably common-place character, and very poor apparently in individuals.

Mr. Pascoe adds the following note:—"It should be mentioned that Dr. Leconte divides the *Rhynchophora* into fourteen families, viz., *Rhinomacerida*, *Rhynchitidæ*, *Attelabidæ*, *Amycteridæ*, *Brachyceridæ*, *Byrsopidæ*, *Otiorhynchidæ*, *Curculionidæ*, *Brenthidæ*, *Calandridæ*, *Anthribidæ*, *Scolytidæ*, *Apionidæ*, and *Belidæ*; all of equal taxonomic value, so that the present position of *Psepholax* among the *Scolytidæ* is not so great a change as it seems to those accustomed to the less sensational classification of Lacordaire."

Papers read, &c.

Mr. J. W. Slater communicated a paper, "On the Food of Gaily-coloured Caterpillars," in which he attempted to show that brightly-coloured larvæ generally fed on plants which were poisonous.

Mr. M'Lachlan stated that the bright coloration of larvæ was no protection from the attacks of ichneumons. He also remarked that the larva of *Diloba cæruleocephala* was found feeding sometimes on sloe and sometimes on laurel, and raised the question whether specimens found on the latter plant would be poisonous, and those on the former innocuous.

Digitized by Google

Mr. Meldola stated that, with regard to the chemical aspect of the question, he believed it possible for a poisonous substace derived from a food-plant to permeate the tissues of a caterpillar without undergoing any change. The evidence upon which this statement rested was to be found in the fact that the colouring matters of some plants had been found by means of the spectroscope in the tissues of larvæ which fed upon them in an unaltered condition. If colouring matters escape the digestive processes unaltered it is probable that organic poisons would do the same. On the other hand, it is well known that larvæ feeding on non-poisonous plants may elaborate poisons by chemico-physiological processes. The larva of *Liparis auriflua*, which feeds upon hawthorn, sloe, apple, oak, &c., and which possesses the well-known property of "urticating," was adduced as an example.

Mr. M'Lachlan remarked that it was now generally admitted that the urticating property was due to mechanical irritation, the numerous brittle hairs of the larva entering the skin.

Mr. Dunning and Mr. Waterhouse raised the question whether the hairs thus penetrating the skin might not possess some poisonous quality.

Mr. Meldola further remarked that he had observed that certain distasteful species of Lepidoptera preserved their disagreeable qualities after death, in proof of which he exhibited some butterflies found among an old collection of Indian insects, the greater part of which had been demolished by mites. The surviving specimens were all of protected species, *viz.* four of a *Euplœa*, one of *Danais plexippus*, and one of *Papilio Pammon*. *Euplœa* and *Danais* were well known to be protected genera, since they serve for models of mimetic resemblance. With regard to *Papilio Pammon*, Mr. Meldola stated that in his belief it was in some way distasteful, as he had seen it in swarms in the island of Nancowry, Nicobar Islands, in April, 1875.

Mr. M'Lachlan stated as a contrary fact that *Cantharides* is particularly subject to the attacks of beetles.

With regard to the means by which bright coloration might have become associated with poisonous qualities in a larva, Mr. Meldola reminded the Society of the experiments of Messrs. Jenner Weir and A. G. Butler, communicated to them in 1869. These gentlemen had proved that brightly-coloured, hairy and spiny caterpillars were generally distasteful, while dull species were devoured. Mr. Wallace was of opinion that the observed correlation between bright coloration, &c., and distastefulness was brought about by means of Natural Selection. Mr. Meldola quoted the following passage from Mr. Wallace's 'Contributions to the Theory of Natural Selection':—"Distastefulness alone would, however, be of little service to caterpillars, because their soft and juicy bodies are so delicate that if seized and afterwards rejected by a bird they would almost certainly be killed. Some constant and easily perceived signal was therefore necessary to serve

Digitized by Google

as a warning to birds never to touch these uneatable kinds, and a very gaudy and conspicuous colouring, with the habit of fully exposing themselves to view, becomes such a signal, being in strong contrast with the green or brown tints and retiring habits of the eatable kinds." (See also Proc. Ent. Soc., March 4, 1867.)

During the meeting the Rev. A. Eaton stated that he had observed a male specimen of *Colias Edusa* in Dorset on June 3rd. Mr. S. Stevens had likewise seen six specimens near Gravesend on June 4th.

July 4, 1877.

Professor J. O. Westwood, M.A., F.L.S., President, in the chair.

Donations to the Library were announced and thanks voted to the donors.

Exhibitions, &c.

Mr. J. W. Douglas exhibited a living specimen of *Cerambyx Heros* bred from a log of wood imported from Bosnia; also a young larva of the same species from the same source.

Prof. Westwood exhibited a number of cases constructed by the larva of some species of *Phryganea* inhabiting Southern Europe. They were composed of small semi-transparent quartz-like particles, and had been described by Swainson in 1840 as a shell belonging to the genus *Thelidomus*, div. *Turbineæ*.

Prof. Westwood also exhibited a specimen of a plant-bug (*Capsidæ*) which had been sent to him by Mr. Alexander Wallace, together with the leaf of an orchis (*Cattleya Aclandæ*), from Bahia. The leaf was covered all over with blisters caused by the attacks of the insect.

Mr. Jenner Weir exhibited a female specimen of *Cicada montana*, taken in his presence in the New Forest by Mr. Henry Auld, who stated that he was attracted to the spot where the insect was concealed by hearing it stridulate.

Mr. J. W. Douglas suggested that possibly the specimen caught did not give rise to the sound heard, but that it was produced by a male concealed near.

Mr. Weir remarked that he had searched for the stridulating organ in the specimen exhibited, and had found traces, although developed but slightly in comparison with those of the male.

Mr. S. Stevens exhibited two living specimens of *Tillus unifasciatus*, taken near Norwood. They fly rapidly in the sunshine, and settle on oak-palings.

Digitized by Google

Mr. J. P. Mansell Weale read notes "On Variations in Rhopalocerous forms inhabiting South Africa." The author, after stating that he had travelled over most of the eastern districts of the Cape Colony, alluded to the distribution of plants as affecting that of insects, and noticed the apparent encroachments of the subtropical flora and insect fauna along the south-eastern seaboard, the absence of any great barriers and the general uniformity tending to produce close variations. He exhibited and remarked on a large series of *Papilio merope*, male and female, some reared by him, and all collected in one small wooded gully, isolated in an open grass country. He also exhibited male and female *Nymphales xiphares* (*Thyestes*), the male of which is wanting in the National Collection, remarking on the apparent imitation by the female of *Amauris echeria*. He next exhibited and remarked on a series of imagines of *Acræa esetria*, some of the forms of which are separated by some entomologists, and stated that all the forms had been reared from larvæ collected on a single plant. He next exhibited a series of *Junonia pelasgis* and *archesia*, showing a very close gradation linking the two forms, and showed that some of the latter approached *J. amestris*, although the alliance was not so evident as in *J. pelasgis*. He objected to the use of the name "species" as too freely used among plants and insects, and suggested that it merely implied a provisionally uncertain distinction of apparently important differences. In illustration of this, he exhibited specimens of *Callosune evarne* and *keiskamma*, two forms hitherto held distinct, but of which the ova, larvæ and pupæ exhibited no differences, although in two broods in successive years the forms appeared separately. He also remarked on artificially produced changes in the pupæ.

Prof. Westwood stated that he had just received collections of Coleoptera and Lepidoptera from South Africa, collected by Mr. Oates.

The Secretary read a letter from Mr. W. G. Gibson, of Dumfries, stating that *Colias edusa* had made its appearance in that district during the month of June, and suggesting that its occurrence might be accounted for by the large importation of foreign clover.

Prof. Westwood stated that Mr. Alexander Wallace had informed him that both *Colias edusa* and *hyale* were very common about Colchester in June.

Prof. Westwood brought under the Society's notice the recent accounts of the appearance of the Colorado beetle in Ontario and near Cologne.

Mr. May handed in a copy of the Memorandum issued by the Canadian Minister of Agriculture in relation to this insect.

Part II. of the 'Transactions' for 1877 was on the table.

Digitized by Google

August 1, 1877.

J. W. Dunning, Esq., M.A., F.L.S., Vice-President, in the chair.

Exhibitions, &c.

Mr. Stevens exhibited specimens of *Teretrius picipes* (Fab.), one of the *Histeridæ*, which he had taken on the same fence, at Norwood, on which he had previously taken *Tillus unifasciatus*. He also remarked on the appearance in his neighbourhood of a second brood of *Colias edusa*, several specimens having been observed by him, all of which were males.

Mr. Smith exhibited, on behalf of Dr. Bennett, of Sydney, who was present at the meeting, a fine pair of the beautiful and rare beetle *Eupholus Bennettii* (Gestro), from Yule Island, New Guinea. It had been described under that name in the 'Annali di Museo Civico di Genova,' viii. 1876.

The Secretary exhibited a specimen of an insect which had been forwarded to him by Mr. Bewicke Blackburn, who stated that a large field of mangolds belonging to the Knight of Kerry, in the Island of Valentia, had been totally destroyed by it. The specimen was examined by several of the members, who agreed that it was the larva of a Coleopterous insect, but in consequence of its imperfect condition it could not be determined.

Mr. Douglas, who was unable to be present at the meeting, had forwarded to Mr. Jenner Weir a letter he had received from Mr. R. A. Ogilvie, enclosing specimens of an insect found in great quantities in a jar of pickles (piccalilly). They confined their attacks to the pieces of cauliflower in the jar, which they appeared to relish, notwithstanding the vinegar, mustard, pepper, &c., in the pickles. The specimens had been submitted to Professor Westwood, who replied that "the flies were the common *Drosophila cellaris*, with their curious two-horned pupæ; and they frequent cellars and cupboards, delighting in stale beer, wine, &c." He supposed that "the cauliflowers were more to their taste than the other things in the jar, being more succulent and flabby." In answer to a question put by Mr. Ogilvie, he said that the eggs were laid in the pickle-jar, and not in the vegetables before they were pickled.

Mr. Douglas also forwarded a letter he had received from Mr. A. H. Swinton, of Guildford, enclosing a specimen of *Myrmica ruginodis*, which, on being placed under a wine-glass, stationed itself at the rim, head downwards, and rapidly vibrating the abdomen, continued "an intense noise," resembling the spiracular piping of the Dipteron, *Syritta pipiens*.

Mr. Enock remarked, with reference to a spider which had been exhibited by Sir Sidney Saunders at a previous meeting as *Atypus Sulzeri*, that he had taken the specimen himself at Hampstead, and that he had since referred it to the Rev. O. Pickard-Cambridge, who stated that the insect

Digitized by Google

was certainly not *A. Sulzeri*, but that he considered it to be *A. Beckii* (Cambridge), which would probably be found to be the same as *A. piceus* (Thorell), though he was not certain, as the only female which he had of that species was too much damaged to admit of any satisfactory comparison The type of *A. Beckii* was an adult male given to him by the late Richard Beck, who was uncertain of the locality, though Mr. Cambridge appeared to think it probable that he had got it from Hampstead, as he often collected there. The example sent to him by Mr. Enock was different from the Isle of Wight species, of which he had several female specimens, but no males, though he believed them to be *A. Sulzeri*. He would be very glad if collectors in the Hampstead locality would look out for the males in the autumn and winter, as if he could obtain that sex it would enable him to put the question, as to species, at rest.

Mr. Enock exhibited a bottle containing a great number of larvæ of *Cossus ligniperda*, which he had found in a portion of a small willow. He had taken fifty-six larvæ out of a piece of wood four feet long.

Mr. Dunning again directed the attention of members to the exhibition by Mr. Jenner Weir, at the last meeting, of a female specimen of *Cicada montana*, which was reported to have been distinctly heard to stridulate, notwithstanding that the insect was a female, and also that the species was one of which even the males were not previously known to stridulate. Mr. Weir stated that since the last meeting he had again been to the New Forest, and had seen, in the possession of Mr. James Gulliver, of Ramnor, near Brockenhurst, two specimens of *Cicada montana*, and he was assured by Mr. Gulliver that the stridulation of the insect was well known to him, and that he was guided by the sound so made in effecting the capture. Mr. Champion said that he himself had captured the insect, and had distinctly heard a loud noise, but whether the sound was caused by the males or females he could not say. Mr. Dunning considered that further evidence was wanting to prove stridulation in the females.

Papers read.

A paper was read by Mr. W. F. Kirby, entitled "Notes on the new or rare *Sphingidæ* in the Museum of the Royal Dublin Society; with remarks on Mr. Butler's recent Revision of the Family."

Papers were also communicated, by Mr. J. S. Baly, on "Descriptions of new Genera and Species of *Cryptocephalidæ*," and by the Rev. H. S. Gorham—"Descriptions of new Species of *Clerida*."

Digitized by Google

September 5, 1877.

Professor J. O. Westwood, M.A., F.L.S., President, in the chair.

Donations to the Library were announced, and thanks voted to the donors.

Exhibitions, &c.

Mr. F. Smith exhibited, on behalf of Mr. G. A. James Rothney, a fine collection of Hymenoptera, collected in the neighbourhood of Calcutta during the past season. The majority of the species belonged to the fossorial division; among them were several fine species of *Sphegidæ* and *Bembicidæ*. In the collection were several new species of the genus *Cerceris*, also a few new species of *Apidæ*, the whole series being in the finest possible condition.

Mr. M'Lachlan exhibited drawings (with details) of the extraordinary insect from Java, described by Wesmael in 1836, under the name of *Himanopterus fuscinervis*, as pertaining to the Lepidoptera. The insect remains to this day unique in the collection of the Brussels Museum. In 1866 Dr. Hagen transferred *Himanopterus* to the Neuroptera as a subgenus of *Nemoptera*. No palpi nor legs existed in the insect when first described, but from the neuration, general form, nature of the clothing, &c., Mr. M'Lachlan is quite certain it has nothing to do with *Nemoptera*, and is truly lepidopterous, allied to the North Indian insect described and figured by E. Doubleday as *Thymara zoida*.

Prof. Westwood stated that in 1876 he had also studied the type, and made drawings and agreed as to its position near *Thymara*.

Mr. M'Lachlan also exhibited leaves of a large species of *Acer* from trees growing in the grounds of Mons. van Volxen, at Lacken, near Brussels. These trees were many of them fifty feet in height, and almost each leaf had one or more large white blotches on it, being the mines of a small sawfly described by Kaltenbach as *Phyllotoma aceris*, a species occurring in England on the wild *Acer campestre*. The insect only first appeared in M. van Volxen's grounds last year, and was now in such extraordinary profusion that the flattened discs formed by the larvæ when full fed made quite a pattering noise as they fell from the trees. Unless the insect should disappear as rapidly as it came, there is every possibility that the combined attacks of the myriads of larvæ may seriously damage the trees.

Prof. Westwood exhibited specimens of two minute hymenopterous insects from Ceylon, closely allied to *Mymar pulchellus*, a British species.

Prof. Westwood also exhibited the two sexes of *Narycius* (*Cyphonocephalus*) *smaragdulus*, sent to him by Mr. James Wood-Mason, having been taken in

Digitized by Google

the Nielgherries. One of the males exhibited was of a purple colour. The insect had remained almost unique since first described by Prof. Westwood, in 1842, in his 'Arcana Entomologica' (vol. i., p. 115).

Mr. J. Wood-Mason exhibited the two sexes of *Phyllothelys Westwoodi*, one of the remarkable species of *Mantidæ*, as to which he had observed and pointed out (in Proc. As. Soc. Beng., August, 1876, and in Ann. and Mag. Nat. Hist., 1876) that the females are distinguished by the presence either of a well-developed foliaceous frontal horn (as in *Phyllocrania*) or of a great vertical cephalic cone (as in *Blepharis* or *Gongylus*) from the males, wherein these processes are represented by mere rudiments; and stated that a pair of *Hestias Brunneriana*, another of the species in which this interesting and novel kind of distinction between the sexes had been observed, was in the collection of the British Museum, under the MS. name of *Oxypilus pictipes*. The latter appeared to be a species common in collections; but of the former he had hitherto seen but five specimens—three females (one a nymph) and two males—all, even the nymph, exhibiting the sexual differences referred to equally and perfectly. The specimens exhibited were, the male from Upper Tenasserim, and the female from Sibságar, in Assam.

Mr. Mason next exhibited a beautifully executed drawing of the great stridulating spider from Assam, *Mygale stridulans*, in a stridulating attitude. This sketch was by Mr. S. E. Peal, who had likewise furnished Mr. Mason with a detailed description of the habits of the creature.

Mr. Mason further announced the discovery of stridulating organs in scorpions. While recently working at the anatomy of a species allied to *S. afer*, he had met with structures which, from his familiarity with the analogous ones in other Arthropods, crustaceans as well as insects, he had at once without hesitation determined to be sound-producing apparatus—even before he had found that sounds could be produced by them artificially by rubbing the parts together or accidentally in the mere handling of alcoholic specimens. He had, however, been enabled to place the matter beyond all doubt; for while at Bombay, waiting for the steamer, he had obtained, by a happy chance from some Hindustani conjurors, two large living scorpions belonging to another species of the same type; these, when fixed face to face on a light metal table and goaded into fury, at once commenced to beat the air with their palps and simultaneously to emit sounds, which were most distinctly audible, not only to himself, but also to the bystanders, above the clatter made by the animals in their efforts to get free, and which resembled the noise produced by continuously scraping a piece of silk-woven fabric, or, better still, a stiff tooth-brush with one's finger-nails. The species—a gigantic one from the Upper Godaveri district—in which he had first observed stridulating organs had these organs more highly developed than in the one experimented upon at Bombay, and must stridulate far more loudly, for by

Digitized by Google

artificially rubbing the parts together in a dead alcoholic specimen he could produce a sound almost as loud as, and very closely similar to, that made by briskly and continuously drawing the tip of the index-finger backwards and forwards, in a direction transverse to its coarse ridges, over the ends of the teeth of a very fine-toothed comb. The apparatus, which, as in the *Mygale*, is developed on each side of the body, was situated—the *scraper* upon the flat outer face of the basal joint of the palp-fingers; the *rasp* on the equally flat and produced inner face of the corresponding joint of the first pair of legs. On separating these appendages from one another, a slightly raised and well-defined large oval area of lighter coloration than the surrounding chitine was to be seen at the very base of the basal joint of each; these areæ constituted respectively the *scraper* and the *rasp;* the former was tolerably thickly but regularly beset with stout, conical, sharp spinules curved like a tiger's canine, only more towards the points, some of which terminate in a long limp hair; the latter crowdedly studded with minute tubercles shaped like the tops of mushrooms. He had met with no stridulating organs in this position in any scorpions besides *S. Afer* and its allies; but in searching for them in other groups he had come to the conclusion that the very peculiar armature of the trenchant edges of the palp-fingers in all the *Androctonoidæ*, and in some at any rate of the *Pandinoidæ* (no *Telegonoidæ* nor *Vejovoidæ* had yet been examined), was nothing but a modification for the same purpose, for the movable finger of this pair of appendages when in the closest relation of apposition to its immovable fellow could most easily be made to grate upon it from side to side so as to produce a most distinct crepitating sound; but when separated from it ever so little appeared to be incapable of the slightest lateral movement. It was his intention on his return to India to endeavour to determine this question, as well as many others relative to the species in which the presence of sound-producing apparatus had now been demonstrated by careful observation and experiment upon living animals.

Mr. Mason finally handed to Prof. Westwood for identification the larva of some homopterous insect with what appeared to be a lepidopterous case-bearing larva attached to its last segment by a tough semi-transparent cord. The specimens were from Bangalore.

Mr. Wormald exhibited, on behalf of Mr. Pryer, a small collection of Chinese Lepidoptera.

Mr. G. C. Champion exhibited some rare beetles from Aviemore, Inverness-shire; among them was *Pachyta sex-maculata*, a Longicorn new to Britain.

Mr. J. Jenner Weir mentioned a case of parthenogenesis in *Lasiocampa quercus*, which had recently come under his notice.

The President read the following letter from Herr A. W. B. Grevelink,

Digitized by Google

of the Hague, relating to the insects which attack the cocoa-nut trees in the West Indies:—

"At Barbadoes the cocoa-nut trees were all destroyed by the *Aleyrodes cocoïs*, which afterwards, according to Sir Robert Schomburgh, extended its ravages over Antigua, Nevis, St. Christopher's, and other islands, from which I infer that it did the same in Martinique, as that island lies in the same line with the rest. The year or years, however, in which all this happened I have never been able to make out, and all that I can gather on this point, from the 'History of Barbadoes,' is that the said trees had been planted after the hurricane of 1831, and that they had attained to maturity when the insect first showed itself, which, as regards the new plantations, cannot well have been earlier than 1837.

"Now it so happened that in March of the same year, whilst serving as Lieutenant on board H.M. Brig 'Echo,' then stationed in the West Indies, I assisted in carrying over from St. Pierre, Martinique, to Curaçao a considerable number of the nopal-plant (*Cactus coccinillifera*), peopled, of course, by the cochineal insect; and as it was not many months afterwards that, in the last-named island, the cocoa-nut trees on some of the estates began to show symptoms of being affected as if by blight, which on examination was pronounced to be caused by an insect of the *Coccidæ* or *Coccus* genus, many persons there have ever since held the opinion that it was introduced at the same time with the cochineal from Martinique, which opinion was not a little strengthened when, in 1839, tidings from that island stated that all the cocoa-nut trees there had been destroyed by an insect (name not mentioned), but which, all things considered, I have not the least doubt was the same species which ruined the cocoa-nut trees at Barbadoes.

"After making a voyage to Europe, I arrived again at Curaçao in the beginning of September, 1838, where I took charge of the estate St, Joris, belonging to my family, on which were about two thousand cocoa-nut trees, the greater part of which were then already in a sickly condition, caused evidently by a microscopic insect which covered every part of the crown and extended also deep down into the heart of the tree, though outwardly the stem remained free from them. I applied every means that could tend to arrest their progress, in which I persevered during several months, but without any perceptible effect, for the fronds turned yellow and dropped to the ground as before. Trees which when I arrived were still healthy successively caught the infection, their leaves withered, and after they, as well as the fruit-stalks, had all dropped, down came also the centre of the crown, when nothing remained but the lifeless trunk, a useless encumbrance to the soil, as the wood is fit for nothing—not even for fuel. On all the other estates they had the same story to relate, and at the end of the year 1839 not one of those noble palm trees remained alive, which, to the number of 20,000, had graced this barren island only a year before.

Digitized by Google

"As for the appearance of the insect which caused this calamity, I can only say that, like other larvæ of *Aleyrodes*, it was not even so big as the head of the smallest pin in common use, and was of nearly circular outline, but quite flat, and as thin as the finest paper. It never moved that I could see, and seemed as if glued to the leaf, on which myriads of them were huddled together.

"Having thus been an eye-witness in the case, you may judge of my astonishment when, only last year, I was informed here at the Hague by a professional entomologist of some repute, that from the communication of a friend of his who visited Curaçao many years after the above-mentioned occurrence, he felt convinced that the cocoa-nut trees in that island have been destroyed by the caterpillar of a nocturnal lepidopteron. This absurd notion I have not been able to dispel, not even by producing extracts from the colonial newspaper, because, said he, although it appears therefrom that the colonists hold the same opinion as I do, yet the question remained whether that opinion is the right one. In reply, I can only say that I never expected an entomologist to believe on mere hearsay that any butterfly will soar to a height of sixty to eighty feet above the ground to lay its eggs in trees which have so little to attract them as those of the order *Palmæ*, whose leaves, from their texture, are unfit to serve as food for the larvæ of Lepidoptera.

"Passing from this subject to that of the destruction of the cocoa-nut trees in the coast regions of Guiana, here in Holland it seems nobody ever heard of those trees suffering from insects in Surinam. I beg to refer to Mr. Russell's report on the *Aleyrodes*, as well as on the beetle, which, long before the arrival of the first-mentioned insect, about three or four years ago, used to spoil the said trees in those districts, and which report must have reached you long since, as it was read at one of the monthly meetings of the Royal Agricultural and Commercial Society in Demerara, and printed in the 'Royal Gazette' (George Town, British Guiana), of the 4th March, 1876.

"From that paper, I see, Mr. Russell says his friend Dr. Whitlock calls the beetle *Passalus tridens*, which, so far as I know, may be very correct, though, judging from the appearance of one I saw in the museum at Leyden, I should not have thought it capable of boring holes which have been compared by Mr. Russell to those made by means of an augur. Among the eight species of *Passalus* enumerated by Dr. Dalton, in his 'History of British Guiana,' I do not find this one; but, of course, that is no reason why it should not be found there, as the author himself does not pretend to give a complete list of insects. I was lucky enough to have the opportunity of inspecting a couple of beetles, which were caught on the estate of a respected friend of mine, the Hon. A. D. van der Yon Netscher, formerly a landed proprietor in Demerara, and member of the Council there. They

Digitized by Google

were trapped by one of his coolies while in the act of burrowing in the ground for the evident purpose of finding their way through a hole in the rhizome up to the top of the tree, in order, by the attacks of their larvæ, to destroy it; the whole according to the manner described by Mr. Russell, whose very interesting account is fully corroborated by Mr. Netscher's, who has very obligingly drawn it up from his own experience, at my request. The beetles are a male and female, well known in the country as belonging to the real destroyers of cocoa-nut trees, and from their very prominent features, easily recognizable as answering in every point—the male to the description of the *Scarabæus aloë*, the other, or female, to that of the *S. alveus* in Dr. Voet's 'Catalogus Systematicus Coleopterorum,' both insects being stated to belong to Surinam. Let me add that, from their hirsute aspect, they look a by no means very amiable couple."

The Secretary exhibited a Longicorn beetle which had been sent from Birkenhead by Mr. David Henderson. It had been captured on the wing in that town, having probably flown from a ship in the river.

Paper read.

Mr. J. W. Slater read a paper entitled "Vivarium Notes on some common Coleoptera."

October 3, 1877.

Professor J. O. Westwood, M.A., F.L.S., President, in the chair.

Donations to the Library were announced, and thanks voted to the donors.

Exhibitions, &c.

Mr. W. L. Distant exhibited a specimen of the ravages of *Dermestes vulpinus* (Fab.) in a cargo of dried hides from China. On the arrival of the hides in this country they were found to be infested and gnawed into holes by swarms of the insect in their different stages, causing a damage of from fifteen to twenty per cent. on the value of the cargo. It is not unusual to see this well-known insect amongst these articles, but quite unprecedented to find it in such numbers and causing such an amount of damage. In fact, its appearance had quite paralyzed the importation of the hides, and gave further proof of the value of Economic Entomology in the arts and manufactures.

Mr. M'Lachlan exhibited a portion of a wooden case containing hides from Shanghai, which was riddled with borings of the larvæ of this beetle.

Prof. Westwood remarked that some years ago the attention of the Society was drawn to the depredations of this beetle in a cargo of cork.

Digitized by Google

Prof. Westwood exhibited drawings of the pupa of a trichopterous insect (*Anabolia nervosa*), which swam about in water like a *Notonecta*, but used its middle legs as swimming apparatus. Prof. Westwood also made remarks upon the structure and situation of the mouth organs of the pupæ of Trichoptera, and stated that the mandibles of the pupæ were unlike those of the larva, while these organs were quite aborted in the imago. The Professor suggested that the mandibles of the pupa were for the purpose of enabling the insect to eat its way out of the case in which it had undergone its transformation, and in which, after cementing down the mouth, it was obliged to turn itself completely round, so as to escape at the opposite free extremity.

Mr. M'Lachlan confirmed this view of the function of the mandibles of the pupæ.

The President next exhibited a small lepidopterous insect from Lake Nyassa, apparently a species of *Psyche*, which had been sent in a paper packet with a pupa-case of a *Tachina*, from which it was stated that the moth had been produced. Prof. Westwood was inclined to believe that the larva of the moth might have simply made use of the empty pupa-case to undergo its transformation in.

Prof. Westwood read a post-card from Mr. Albert Müller announcing the formation of an entomological station at Basle.

The President then referred to the lepidopterous larva attached to a specimen of the homopterous *Eurybrachys spinosa*, which had been handed over to him by Mr. Wood-Mason at the last meeting, and exhibited drawings of both insects, the former being evidently identical with the species formerly described as being parasitic upon *Fulgora candelaria* (Trans. Ent. Soc. 1876, p. 519). In the absence of direct observation, the President was inclined to believe that the relation of the lepidopterous larva to the Homopteron was one of true parasitism, the former insect feeding on the waxy secretion of the latter, it being well known that certain lepidopterous larvæ of the genus *Galleria* feed upon wax.

Mr. Wood-Mason stated that the interesting specimen which he had handed to Prof. Westwood at the last meeting consisted of a lepidopterous larva clinging by its anal pair of prolegs to the free extremity of a stout, tough, flaccid cord, which was firmly fastened to the dorsal surface of the abdomen of the Homopteron. The specimens were captured in August or September, 1876, at Bangalore, South India, by Mr. G. Nevill. The caterpillar was closely allied to *Epipyrops* (West.). The cord to which it was clinging, Mr. Mason considered to be the wet and matted remains of a case or sac, from the imperfectly closed aboral or free end of which the caterpillar had suddenly withdrawn itself (the case-bearers, as well known, readily being able to turn in their cases) on immersion in alcohol, and on which its anal pair of prolegs had closed in their death-grasp. The end of

Digitized by Google

the cord fastened firmly to the back of the Homopteron being the oral or attached end of that case; *i. e.*, the end by which the case-bearers fasten themselves when at rest to the twigs and branches of the plants on which they live, the attachment being quite as firm, or even firmer, than that of the present specimens. Mr. Wood-Mason's view of the nature of the relation of the caterpillar to the Homopteron in all these cases had always been that the former is the messmate of the latter rather than its parasite, merely making use of it as a vehicle whereon to reach its vegetable food, just as in the curious case recently brought to notice by Fritz Müller ('Nature,' vol. xv., p. 264), and employing—as Colonel Godwin-Austen's valuable note on the specimen found by him on *Aphæna*, sp., and his own examination of that specimen in its cocoon seemed conclusively to prove—some of its messmate's wax to cover its body (and in some instances for the construction of a case), in order probably to render itself less conspicuous to its enemies (*Ichneumonidæ, Tachinidæ, &c.*) than it would be as a naked, fleshy, yellowish grub upon the white wax-covered surface of its messmate's body. He had opened the flattened squarish cocoon constructed by Col. Austen's specimen, and found the body of the enclosed caterpillar still clothed thickly on its upper surface with the satiny asbestos-like waxy substance secreted by its messmate. This specimen was probably identical with Professor Westwood's *Epipyrops*, while the one from Bangalore represented a different but closely-allied form, distinguished in the larval condition by the presence of a well-developed case, which may or may not have been rendered less conspicuous by a covering of wax borrowed from its homopterous "chum."

With reference to the firmness of the attachment of the cord to the back of the Homopteron, Mr. Jenner Weir reminded the Society that the larvæ of *Psyche* were always most firmly fixed, and Mr. M'Lachlan stated that the larvæ of *Phryganea* glued down their cases with great firmness under water.

Mr. W. L. Distant raised the question as to whether the Homopteron frequented the plants on which the caterpillar fed or whether the latter was omnivorous.

Prof. Westwood also mentioned a small dingy moth from Brazil, of which numbers had been found upon the Three-fingered Sloth, *Bradypus tridactylus*.

Mr. Meldola exhibited a collection of Lepidoptera, from Ceylon and the Nicobar Islands, formed by him in 1875. Among them were a few species new to science. The collection had recently been worked out by Mr. F. Moore.

Mr. H. Goss exhibited a series of specimens of *Lycæna* (*Cupido*) *Arion*, taken in the Cotswolds in June, 1877. One-third of the specimens exhibited were far below the average size, the remainder being of the normal size. Both forms were taken flying together at the same time of

Digitized by Google

the year and in the same locality. Mr. Goss stated that according to his experience these dwarf specimens did not occur in the same proportion in other parts of the country where the species was taken. The specimens he had obtained in Devonshire and Northamptonshire were, as a rule, of the average size.

The Secretary stated that the Longicorn beetle exhibited at the last meeting, which had been sent from Birkenhead by Mr. David Henderson, had been identified by Mr. C. O. Waterhouse as *Monohammus titillatus* (Fab.), a species inhabiting the United States.

Papers read.

"On *Notiothauma Reedi*, a remarkable new Genus and Species of Neuroptera from Chili, pertaining to the Family *Panorpidæ*," by R. M'Lachlan, F.R.S., &c.

"On the Lepidoptera of the Family *Lithosiidæ* in the Collection of the British Museum," by Arthur G. Butler, F.L.S., F.Z.S., &c.

November 7th, 1877.

Professor J. O. Westwood, M.A., F.L.S., President, in the chair.

Donations to the Library were announced, and thanks voted to the donors.

Exhibitions, &c.

Mr. M'Lachlan exhibited ten of the thirteen species of Lepidoptera collected by Captain Feilden and Mr. Hart in Grinnell Land, between the parallels of 78° and 83° N. lat., during the recent Arctic Expedition. They consisted of *Colias Hecla*, Lef., var.; *Argynnis polaris*, Bdv.; *A. Chariclea*, Schnd., many vars.; *Chrysophanus phlæas*, Linn., var.; *Lycæna Aquilo*, Bdv.; *Dasychira Grœnlandica*, Wocke; *Mamestra?* n. sp.; *Plusia parilis*, Hübn.; *Psycophora Sabini*, Curt.; and *Scoparia*, n. sp. He entered into some details respecting the insects generally of this high northern region and their habits, in anticipation of his extended Report to be read at the next meeting of the Linnean Society.

The Rev. A. E. Eaton remarked, with regard to Arctic insects, that he was disposed to consider that their transformations may sometimes be protracted through two or more summers. He adduced some apparently analogous phases in respect of plant life in Spitzbergen, where he had noticed, in June, plants seemingly upon the point of flowering, which had evidently remained in that state under the snow since the previous autumn. He said that in the islands referred to insects are not altogether indifferent

Digitized by Google

to the approach of midnight, although the diurnal variation of light does not, in July, equal in intensity the difference between rural sunshine in this country and the light which passes for daylight in London when the sky is slightly overcast. He mentioned, in conclusion, that no *Bombus* has been hitherto found in Spitzbergen, and that *Pedicularis hirsuta* appeared to be unvisited by insects in that archipelago.

In reply to a question from the President as to the habits of the Arctic *Culex*, the Rev. A. E. Eaton remarked that when in Spitzbergen he had suffered much from the attacks of this insect, which had the habits of a true mosquito.

Mr. Meldola exhibited a five-winged specimen of *Gonepteryx rhamni*, caught near Brandon, Norfolk, in August, 1873, by Mr. John Woodgate. He also exhibited a gynandromorphic specimen of *Pieris brassicæ*, taken near Thame, Oxfordshire, by Mr. J. B. Watson, in August, 1877. In this last specimen the right fore and hind wings were female and the left male; the right antenna was also longer than the left.

Mr. H. Goss exhibited an hermaphrodite specimen of *Gonepteryx rhamni*, caught in Abbot's Wood, Sussex. He stated that he believed the specimen to be what Ochsenheimer called a "perfect hermaphrodite," the whole of the *right* side, both in characters and organs, being female and the whole of the left side male. Mr. Goss remarked that from the recorded instances of hermaphroditism among the Lepidoptera it appeared that it was more common for the *left* side to belong to the female sex, and that in fourteen out of twenty-three instances of perfect hermaphrodites cited by Burmeister this was stated to be the case, and only in nine instances out of the twenty-three did the female characters and organs appear on the right side.

Mr. J. W. Douglas exhibited the following insects:—

1. An example of *Polyphylla Fullo*, Linn., which flew on to a steam vessel at Antwerp in August, and was thus brought to London.

2. A specimen of *Tettigometra impressopunctata*, Duf. (a rare species, and the only representative of the genus in Britain), which was taken casually, on October 1st, at Sanderstead Downs, this being the fourth recorded locality in this country.

3. An example of *Typhlocyba debilis*, Doug., taken at the same time and place as the last-mentioned; also *T. tenerrima*, H.-Schf., its nearest ally, to show the difference of the species.

Mr. W. C. Boyd exhibited a larva of *Pieris rapæ*, which had been attacked by *Microgaster*. (See Proc. Ent. Soc., July 5th, 1875, and December 6th, 1876.)

Prof. Westwood read notes on new exotic lamellicorn Coleoptera, and exhibited specimens of *Calomelopus Nyassæ* and *Amblyodus Nicaraguæ*, also drawings of these beetles and of *Valgus furcifer*, Sumatra; *Nicagus*

Digitized by Google

obscurus, North America; *Cyclidius velutinus*; *Cremastocheilus crassipes*, California; and *Pantodinus Klugii*, Guatemala.

Prof. Westwood called the attention of the Society to a letter in 'Nature' (Nov. 1st, 1877, p. 11), from Mr. J. Saville Kent, *à propos* of Mr. Wood-Mason's discovery of stridulating apparatus in scorpions, announced to the Society at the September meeting, and from which letter the following is an extract:—

"The Crustacean in question, which I have ascertained to possess sound-producing properties to an eminent degree, is a species of *Spheroma*, belonging to the isopodous order of the class. I have not as yet ascertained the exact method in which sound is produced, nor whether the animal has organs specially adapted for the purpose: on numerous occasions, however, my attention has been attracted to the glass jar of which, with the exception of microscopic Copepods and Protozoa, a single specimen of the species is the sole animal occupant, by a little sharp tapping sound produced three or four times consecutively, with intervals of about one second's duration, and which I can almost exactly imitate by gently striking the side of the jar with the pointed end of a pipette. On being approached the little creature always endeavours to elude notice by passing to the opposite side of the stalk of sea-weed upon which it usually reposes, in the same way that a squirrel dodges round the branch of a tree; and on no occasion, so far, have I been able to catch the little fellow *flagrante delicto*, or in the act of producing the sound which it most undoubtedly emits. The character and intensity of the sound produced, associated with the small size of the animal, scarcely one quarter of an inch in length, induces me to believe that it is caused by the sudden flexion and extension of the creature's body." Mr. Kent also mentions the snapping sound produced by *Alpheus ruber* and the "shrill squeaking sound" emitted by the large sea crayfish (*Palinurus quadricornis*) when handled, this sound being produced "by the rubbing together of the spinous abdominal segments."

Mr. Wood-Mason remarked that structures in Crustacea, some of which certainly, and all of which probably, are for the production of sounds, were first brought to notice by Hoffmann,—in V. der Decken's 'Reisen in Ost-Africa (Crustaceen)'—but had been independently observed by himself in a number of species during his dredging excursion to the Andaman Islands in 1872. They were paired organs, as in Scorpions, the Mygale, and the Phasma to be brought to notice that night—that is to say, organs working perfectly independently of each other were on each side of the body. In some forms (I.) they were seated partly on the body (carapace) and partly on a pair of appendages; of these some (*a*) had the *scraper* on the body and the *rasp* on the appendages—e.g., *Matuta*, in which the organs are developed in both sexes; and others (*b*) had the *rasp* on the body and the *scraper* on the appendages—e.g., *Macrophthalmus* et affinia, in which the scraper was

Digitized by Google

formed by a sharp-edged lamellar projection on the meropodite of each of the chelipeds, and the rasp was the crenulated infraorbital margin: in these the apparatus could only be developed in the males, the females having short and small and quite inconspicuous chelipeds, which hardly reached so far as to the margins of the orbits. In others (II.) they were seated wholly on the appendages; in the males of the species of *Ocypode* the *rasp* was on one and the *scraper* on another part of the same appendage; in those of *Platyonychus bipustulosus* the *rasps* were on one and the *scrapers* on another pair of appendages; the walking-legs of the second pair were here very long and robust, and their third joint (meropodite) had its upper margin produced upwards at apex into a sharp crest (the *scraper*); both Dana and Milne-Edwards had noticed the remarkable length and structure of this pair of legs, but the former alone had mentioned, in his description of the species, the regular transverse plication of the under surface of the propodite of the chelipeds, which constituted without doubt the *rasp*. The above did not pretend to be a complete account of stridulating apparatus in Crustacea; but separated as he at present was from notes, drawings, and specimens he could not go into greater detail. The cases of *Macrophthalmus* and of *Platyonychus* had not, he believed, been previously recorded. In the forms alluded to by Mr. Kent no special sound-producing apparatus seemed to be developed. Everybody who had searched for animals on coral-reefs or had dredged in tropical seas was familiar with the "clicking" sounds emitted by the *Alphei* and their allies. The sounds which here always accompanied so sudden an opening of their claws to their fullest extent that dislocation seemed imminent each time, might be caused either by the impact of the dactylopodite upon the joint to which it is articulated or by the forcible withdrawal of the huge stopper-like tooth of the dactylopodite from its pit in the immovable arm of the claw; in which latter case the noises might be susceptible, *mutatis mutandis*, of the same physical explanation as that produced by the withdrawal of a tightly-packed piston from a cylinder closed at one end. These were the explanations that occurred to him while watching a small species that lived in force amidst the branches of the zoophytes called *Spongodes*, the masses of which crackled all over when brought to the surface. The sounds in this case resembled very closely those made when sparks were taken by the knuckles from the prime-conductor of a small electrical machine. The sounds emitted by the Sphæromid might possibly be produced by the impact of the terga of the posterior somites upon one another at the end of each movement of extension.

Mr. Wood-Mason then announced the discovery of stridulating organs in *Phasmidæ*, in a species of *Pterinoxylus*, and in illustration of his remarks exhibited an impression of Westwood's plate of Serville's species, *P. diffor-mipes*. Here, as in Crustacea and some other Arthropods, an apparatus working perfectly independently of its fellow was developed on each side of

Digitized by Google

the body. The rough prominent basal portion of the costal nervure of the wings formed the rasp, in connection with which was developed a large oval "speculum," "talc-like spot," or "mirror." The rasps were scraped by the sharp and hard front edges of the tegmina, the dome-like form of which seemed admirably adapted and probably did, to some extent, serve to increase the sound by resonance. In Serville's species, according to Westwood's figure, the stridulating apparatus appeared to be more highly developed, the "mirror" being more distinct and the tegminal cavities much more spacious. The males of the *Pterinoxyli* were unknown. We had here another case in which functional stridulating organs are present in females. The only other insects known to him in which stridulating organs were seated partly on the wings and partly on the tegmina were the orthopterous *Œdipoda*, which, according to Scudder (Amer. Nat., ii. 113), stridulate during flight, in connection with which fact it was interesting to observe that the female *Pterinoxyli*, though incapable of flight, needed to expand their organs of flight in order to bring their similarly situated apparatus into play.

Professor Westwood mentioned the formation of a "Channel Islands' Museum and Institute of Pisciculture Society" in Jersey.

The President also brought under the notice of the Society a recently-published paper by Dr. Anderson (Proc. As. Soc. Beng., Aug. 1877), containing an account of *Gongylus gongylodes*, Linn., a remarkable Indian *Mantis*, the pupa of which is stated to resemble a flower, both in colour, marking, form, and attitude, this resemblance being, it is suggested, for the purpose of attracting insects on which the pupal *Mantis* feeds.

Mr. Wood-Mason stated that the remarkable form and coloration of *Gongylus gongylodes*, and of other species of *Mantidæ*, had been known to him for years, but had remained an inexplicable puzzle till December, 1875, when his valued and talented correspondent, Mr. S. E. Peal, of Assam, informed him that he had just captured "a little rose-pink *Mantis* that simulates a blossom beautifully;" and six months later a second "beautifully white (wax-white) and larger than the previous pink one." On examination these specimens proved to be larvæ of *Hymenopus bicornis* of Serville, an insect of great rarity, and only up to that time recorded from Java. The species had the thighs of the four posterior legs expanded into broad pear-shaped plates; so that when seated on a twig with thorax and abdomen raised at right angles to one another, with the fore-legs drawn out of sight under the thorax, and with the four expanded thighs of the rest of the legs spread out two on each side, the "feet" of all these legs being brought to one spot, in form as well as in colour it must present a most perfect and deceptive resemblance to a flower. Here form conspired with colour in a most inimitable manner to produce the deception. The principal reason why this observation of Mr. Peal's was not published long ago was that

Digitized by Google

there was no evidence that insects were attracted to the coloured Mantises as insects to flowers, for if this were not so the resemblance was meaningless; but the evidence required having been published by Mr. Wallace in the September number of 'Macmillan's Magazine,' he had come prepared to make known Mr. Peal's and his own observations, little expecting that reference would be made to the same subject from the chair. According to Mr. Wallace, a small *Mantis* which exactly resembled a pink *Orchis*-flower was shown to Sir Charles Dilke in Java. This species was not only said to attract insects, but even the kind of insects (butterflies) which it allures and devours was mentioned.

Mr. Wood-Mason, in reply to a question of the President, stated that *Schizocephala bicornis*, a species remarkable for its enormously elongated and filiform legs and body, was really another case of the same *offensive* (as opposed to the purely *defensive resemblance* of, for example, the *Phasmidæ*) resemblance. It lived on tall grasses (*Saccharum spontaneum*—wild sugar), to which in course of time it had gradually become perfectly assimilated in form as well as in colour; and in the adult condition was fully thirty times as long as broad, but when it quitted the egg the length of the body, in proportion to its greatest breadth, was only as about fifteen to one; from which fact in its development we might with confidence infer that the species is descended from some shorter and stouter form; that this could only have differed by characters of the most subordinate importance from such existing African and Indian forms as *Episcopus chalybea* (actually by Burmeister referred to the same genus), *Oxyophthalma collaris, gracilis*, &c., it was only necessary to study those forms to become convinced of.

Sir Sidney Saunders read the following:—

"*Remarks on the Specific Identity of the Hampstead Atypus.*

"In the report of our Proceedings at the August meeting of this year, which has just appeared in the third part of our 'Transactions' (p. xv.), it is stated that the spider exhibited by me at a previous meeting as *Atypus Sulzeri* had since been referred to the Rev. O. Pickard-Cambridge, who stated that the insect was certainly not *A. Sulzeri*, but that he considered it to be *A. Beckii* (Cambridge), which would probably be found to be the same as *A. piceus* (Thorell), though he was not certain, as the only female which he had of that species was too much damaged to admit of any satisfactory comparison, the type of *A. Beckii* being an adult male. I was not present at the meeting referred to, or I should have explained that the identical specimen which I had exhibited could not be the one referred to by Mr. Cambridge, it having never since passed out of my hands. But, as regards the name ascribed to the Hampstead species, Thorell, in his 'Synonyms of European Spiders' (published 1870—1873), adopts the

Digitized by Google

name of *Atypus Sulzeri* (Latr.) for the species which Sulzer had named *Aranea picea* in 1776, and which Thorell gives as synonymous with—

Atypus piceus, Thor., 1870,
„ „ Ausserer, 1871, and
„ *Sulzeri*, Koch, 1848.

"M. Eugène Simon, in his memoir on the French species of the genus *Atypus* (Ann. Soc. Ent. Fr., 5e sér., tome iii., 1873, p. 109), reverts to the original specific name of *A. piceus* (Sulzer), as entitled to priority, while repeating the synonyms as aforesaid. Thus the Hampstead species, which is said to be certainly not the *A. Sulzeri*, but possibly the *A. Beckii* (Cambridge), and probably the same as *A. piceus* (Thorell), would, in such case, be synonymous with Sulzer's species, which is the *Atypus Sulzeri* of Latreille (1806), of Koch (1848), and of Thorell (1873), and the *Atypus piceus* of M. Eugène Simon (1873)."

Mr. F. Enock exhibited the male and female of this spider, taken at Hampstead on October 24th, 1877, and read extracts from a letter from the Rev. O. P.-Cambridge, to the effect that the male specimens afterwards submitted to him were *Atypus Sulzeri*, and not *A. Beckii*, as at first conjectured when females only had been examined. (See above paper by Sir Sidney Saunders.)

Papers read.

Mr. C. O. Waterhouse read a paper containing "Descriptions of new Species of the Coleopterous Genus *Callirhipis* (*Rhipidoceridæ*) in the British Museum," and exhibited specimens of *C. longicornis*, male, Waterh. (Andaman Islands), and *C. dissimilis*, male and female, Waterh. (Borneo).

The Rev. H. S. Gorham communicated the continuation of his "Descriptions of New Species of *Cleridæ*, with Notes on the Genera and corrections of Synonymy."

Mr. A. G. Butler communicated a paper containing "Descriptions of a New Genus and two New Species of *Sphingidæ*, with general Remarks on the Family."

Mr. J. S. Baly communicated "Descriptions of New Genera and of uncharacterized Species of *Halticinæ*."

New Part of 'Transactions.'

Part III. of the 'Transactions' for 1877 was on the table.

Digitized by Google

December 5, 1877.

J. W. Dunning, M.A., F.L.S., Vice-President, in the chair.

Donations to the Library were announced, and thanks voted to the donors.

Exhibitions, &c.

Mr. W. L. Distant exhibited two rare species of Hemiptera-Heteroptera from the West Coast of Africa, viz. *Tetroxia Beauvoisii*, Fairmaire, described in 1858, but according to Stål the type, in the possession of Signoret, is without antennæ, rostrum, abdomen or legs, and is also placed by Stål amongst "species incerti generis;" and *Oncocephalus subspinosus*, A. & S., described in 1843; according to Stål the type, in a bad condition, is in the collection of Signoret.

Mr. F. Smith exhibited a fine series of both sexes of *Macropis labiata*, captured by Mr. J. B. Bridgman, of Norwich, at Brundall, near that city. A British specimen of the male had for many years been unique in the collection of the British Museum; at length a second male was taken in the New Forest by the late Mr. J. Walton, and twenty years subsequently Mr. S. Stevens took a third at Weybridge. During the past season Mr. Bridgman took both sexes in some numbers.

Mr. Smith also exhibited a specimen of *Rophites quinquespinosus*, captured at Guestling, near Hastings, by the Rev. E. H. Bloomfield during the past season. This capture added a new genus and species to the British Hymenopterous fauna, and was the most important addition that had been made for many years.

Mr. Meldola exhibited three photographic enlargements of micro-photographs by Mr. Edward Viles, of Pendryl Hall, Wolverhampton. These photographs, two of which were of parts of insects,—*viz.* the mouth organs of a bee and the proboscis of a fly,—had been exhibiteu at the recent Exhibition of the Photographic Society of London, and had obtained one of the Society's medals. The original negatives, taken by means of the object-glass of a microscope fitted into the camera in place of the ordinary lens, were 3 inches square, while the finished enlargements were 30 × 24 inches, being thus enlarged 10 diameters.

Mr. Meldola next exhibited an acoustal experiment illustrating the effects of resonance in increasing the volume of sound emitted by a vibrating bell. This illustration gave experimental demonstration of the action of the stridulating apparatus of the *Pterinoxylus* mentioned at the last meeting by Mr. Wood-Mason. In this insect the sound-producing structure is the vibrating membrane known as the "talc-like spot," which is surrounded by a "milled" edge or rasp which is scraped by the hard

Digitized by Google

edges of the tegmina, the membrane being thus thrown into vibration and the sound enhanced by the resonance of the dome-like cavities of the tegmina. In the experiment shown, the membrane was represented by the bell which was thrown into vibration by a violin-bow, representing the *scraper*, and the tegminal cavities were represented by a closed air-chamber adjusted to the note of the bell.

Mr. Meldola likewise exhibited a specimen of *Gongylus gonglylodes* found in an old collection of Indian insects, *à propos* of the recent observations on this species (see Proc. Ent. Soc., Nov. 7th, 1877, p. xxix.).

Mr. Wood-Mason remarked that he had been recently making a close investigation of the stridulating apparatus of scorpions, and had detected at the base of each pair of legs carrying the stridulating apparatus a well-defined pore opening into the interior of the leg. He made remarks upon this structure, and gave further details in anticipation of a more extended communication to be made to the Society.

Mr. M'Lachlan remarked that the stridulation of the pupa of *Thecla rubi* appeared to be well-established by the recent observations of Herr F. G. Schild ('Stettiner entomologische Zeitung,' xxxviii. 86, 1877), and of Herr Kleemann, of Nuremburg, made so far back as 1774, and communicated to vol. iv. of the 'Naturforscher' (p. 123).

Mr. F. Smith mentioned an instance of stridulation occurring among the small species of British *Curculionidæ* in a species of the genus *Acalles*. Mr. Wollaston described a species belonging to this genus found by himself in Madeira, and which he calls the musical *Acalles*. The species found at Deal is very much smaller than the *Acalles roboris*, but it is also musical, although the stridulation of a single insect was scarcely audible; but on placing several in a small box and disturbing them by shaking, the shrill grating noise was very distinctly heard. The noise is produced by the friction of the segments of the abdomen against the under side of the elytra.

Mr. J. W. Dunning called the attention of the Society to a paper recently published in the 'Proceedings' of the Cambridge Philosophical Society (vol. iii., part ii., Feb. 12th, 1877), "On a striking instance of Mimicry, with some Notes on the Phenomenon of Protective Resemblance," by Mr. Neville Goodman, M.A. The insect mimicked is the well-known hornet, *Vespa orientalis*, which is found commonly round the shores of the Mediterranean, and extends through Upper Egypt, Syria and Arabia, into Hindostan. The imitator is a species of *Laphria*, the resemblance consisting in similarity of colour, size, shape, attitude when at rest, and mode of flight. The author points out that the word "mimicry" is best applied to cases of resemblance of one living being to another, and suggests that the term "protective resemblance" should be confined to cases of assimilation to stones, sticks, bark, lichens, dead leaves, &c. The author also refers to

Digitized by Google

the fact that the phenomenon of resemblance (both mimetic and protective) is one of degree, and insists that this fact is entirely in favour of the view of the production of such resemblances through the agency of the "survival of the fittest," but is quite inexplicable on the teleological view of the origin of species.

The Secretary directed attention to a letter in 'Nature' (Nov. 15th, 1877, p. 45), detailing some experiments made upon *Abraxas grossulariata*, which tended to show that the insect was sensitive to certain sounds, and remarked that these facts appeared to lend experimental support to the existence of an organ of hearing in Lepidoptera, as recently described by Mr. A. H. Swinton (Ent. Mo. Mag., Nov. 1877).

Papers read.

Mr. F. Smith read a paper containing "Descriptions of new Species of Hymenopterous Insects of New Zealand, collected by Prof. Hutton at Otago." The author exhibited a collection of the insects in illustration of the paper, in which seventeen new species are described.

Mr. A. G. Butler read a paper "On the Lepidoptera of the Amazons collected by Dr. James W. H. Trail during the years 1873 to 1875—Part ii. Sphinges and Bombyces." The author directed attention to the following remarkable cases of parallelism :—

1. Transparent genera with white wings.
Prismoptera, n. gen. (Amazons) = *Ernolatia*, Walk. (Borneo).

2. Opaque genera with coloured wings.
Anthrocroca, n. gen. (Amazons) = *Norasuma*, Moore (Darjeeling).

Prismoptera and *Anthrocroca* agree in neuration with one another, but differ entirely (in the neuration of the primaries) from the Asiatic genera, which likewise agree in neuration with one another. Moreover, there is a similar difference in structure between *Prismoptera* and *Anthrocroca* to that between *Ernolatia* and *Norasuma*, *Prismoptera* and *Ernolatia* having more prominent prothorax, comparatively longer antennæ, and transparent wings.

Dr. Sharp communicated "Descriptions of eight new Species and a new Genus of *Cossonides* from New Zealand," and "Descriptions of some new Species and a new Genus of Rhynchophorous Coleoptera from the Hawaiain Islands."

Digitized by Google

ANNUAL MEETING,

January 16, 1878.

Professor J. O. Westwood, M.A., F.L.S., President, in the chair.

An abstract of the Treasurer's Accounts for 1877 was read by Mr. J. W. Dunning, one of the Auditors, showing a balance of £9 18s. in favour of the Society.

The Secretary read the following:—

Report of the Council for 1877.

In accordance with the Bye-Laws, the Council begs to submit the following Report:—

During the year 1877 twelve new Members and Subscribers have been elected into the Society, and seven have been lost by death or resignation. The losses by death are Henry Adams, E. W. Robinson (whose artistic labours for many years enriched our 'Transactions'), James Scott Bowerbank (one of the original Members of the Society, well known as a microscopical entomologist), and William Arnold Lewis (who met with an untimely end in the Alps).

The 'Transactions' for the year (exclusive of 'Proceedings') form a volume of 439 pages, containing ten plates, of which two are coloured. Although somewhat smaller than last year's volume, which contains twenty memoirs, the 'Transactions' for 1877 compare favourably with it in the variety of the communications, which comprise twenty-eight memoirs. The 'Journal of Proceedings' for the year has been enriched by many communications of considerable scientific value from our Members and their correspondents. The thanks of the Society are due to Professor James Wood-Mason for the plate of *Mygale stridulans*, illustrating his note on that remarkable spider.

It is satisfactory to find that the income of the Society for the year has been sufficient to meet the expenditure. The unusually large sum of £109 has been realized by the sale of the 'Transactions.'

The following is an abstract of the financial account:—

Receipts.		Payments.	
Balance in hand	£6	Rent, Office and Meeting Expenses	£115
Contributions of Members	195	Publications	208
Sale of Publications	109	Library	14
Interest on Consols	9		
Donations	27		
	£346		£337

Digitized by Google

The chief alteration in our publications to which the Council wish to direct attention is one affecting the 'Journal of Proceedings.' The list of "Additions to the Library," instead of being published monthly, as heretofore, will be printed collectively, in alphabetical order, at the end of the volume.

The Council again desires to point out the advantages that may be derived by Town Members by an extra annual prepayment of half-a-guinea, which payment places them in the same position as Country Members with respect to the 'Transactions,' each part being posted to such subscribers on the day of publication.

The Library has been increased during the year by more than the usual donations, and the increasing use made of it by Members may be taken as a clear confirmation of the advantages arising from having it open daily. The Society has to regret the enforced resignation of the office of Honorary Librarian by the Rev. T. A. Marshall, through his acceptance of a colonial appointment, and during nine months the duties have been performed by Mr. Grut. The Council desires to thank the Senior Secretary for undertaking this voluntary addition to his labours.

11, Chandos Street, Cavendish Square,
January 16th, 1878.

An Address on the progress of Entomology during the past year was then delivered by the President.

Prof. J. Wood-Mason and Mr. S. Stevens were appointed scrutineers.

The following Members of Council were elected for 1878:—H. W. Bates, G. C. Champion, J. W. Douglas, Rev. A. E. Eaton, F. Grut, R. Meldola, E. Saunders, J. Jenner Weir, Prof. J. O. Westwood, W. L. Distant, E. A. Fitch, G. Lewis, and F. Smith.

The following Officers were subsequently elected:—President, H. W. Bates, F.L.S., F.Z.S.; Treasurer, J. Jenner Weir; Secretaries, R. Meldola and W. L. Distant; Librarian, F. Grut.

Mr. M'Lachlan proposed a cordial vote of thanks to the President, and moved that his Address should be printed; the motion was seconded by Mr. S. Stevens, and carried unanimously. A vote of thanks to the other Officers was proposed by Mr. Dunning, seconded by Mr. Fenn, and also carried unanimously. Messrs. Jenner Weir, Grut and Meldola replied, and the meeting was adjourned to February 6th.

Digitized by Google

THE PRESIDENT'S ADDRESS.

GENTLEMEN,

The task imposed on the President of this Society, of giving a report of the progress of the Science during the past year, is annually becoming more difficult: the vast range of the subject, the multitude of workers, and the numerous means of publication in all parts of the world, render it impossible for anyone to keep himself thoroughly *au courant* with every branch of the subject, especially if, as in my case, he reside at a distance from London and its great central scientific libraries. If I contrast the activity which now everywhere appears with the state of the Science and the condition of its literature when, fifty-eight years ago, I commenced the study of Entomology, the difference is most striking and almost overwhelming. Then there was no Entomological nor Zoological, nor even a Natural History Magazine in existence; neither Entomological nor even Zoological Society, either at home or abroad; and Berkenhout's 'Synopsis,' Wood's 'Linnean Genera of Insects,' and Samouelle's 'Useful Compendium' were our guides. In what I now propose to offer to your notice I have been guided more by general considerations, and the investigation of views more extensive, than the dry recapitulation of technical descriptions; and I have also abstained to a great extent from abstracting or noticing memoirs published in exclusively Entomological works which can or ought to be in the hands of all workers. The annual summaries of Entomological works published in this country and on the Continent* will eventually complete the very imperfect sketch which I here offer you.

* The 'Zoological Record' for 1875 appeared in the course of the last year. The Entomological 'Bericht' for the years 1873 and 1874, by Herr Bertkau, appears in the Archiv. f. Naturg., fortieth year, 2nd part, and has been republished in the Deutsche Entom. Zeitschr., twenty-first year, 1877, and a translation of the Bibliographical part of my last year's Address has appeared in Dr. Katter's 'Entomologische Nachrichten.'

Digitized by Google

Obituary.

It is with the utmost regret that I commence this report with the record of the decease of several of our most talented Entomologists.

In Thomas Vernon Wollaston, Entomologists have lost one of the most assiduous as well as the most talented of their body. Elaborately minute in the descriptions of the species of insects which he had collected with so much zeal and studied with so much care, he was yet endowed with broad and well-formed generalisations of the Science which he loved, and which were developed not only in 'Variation of Species,' published in 1856, but in the 'Introductions' to all his subsequent publications on the insects of the Atlantic Islands, a study which he has made his own. Born on the 19th March, 1821, he became a student of Jesus College, Cambridge, and was afterwards compelled, for a long portion of his life, to pass much of his time in a warmer climate, on account of pulmonary weakness; and selecting Madeira as his temporary residence, he collected the insects and shells of this island, and subsequently those of the Canaries, the Cape Verde Archipelago, and more recently the Island of St. Helena, with the greatest energy, notwithstanding his generally debilitated state. His 'Insecta Maderensia,' 1854; 'Catalogue of the Coleoptera of Madeira,' 1857; 'Catalogue of the Coleoptera of the Canaries,' 1864; 'Coleoptera Atlantidum, 1865; 'Coleoptera Hesperidum,' 1867; and 'Coleoptera Sanctæ Helenæ,' just published, form a series of works unequalled in the literature of the Order. In Hagen's 'Bibliotheca Entomologica' there is a list of thirty-four separately published menoirs and notes, from 1847 to 1861. The titles of ten more, published in 1861—3, are given in the Royal Society's Catalogue of Papers, since which time numerous additional memoirs have appeared from his pen. The type-specimens of all his collections were purchased by the British Museum, but the large mass of his specimens, including nearly all his species, were purchased by Mr. and Mrs. Hope, at the price of £500, and are deposited in the Oxford Museum. His death, on the 4th of January, was awfully sudden, and his memory, both as a man of Science and a Christian gentleman, will be cherished by all who knew him.

Digitized by Google

Andrew Murray, F.L.S., died on the 10th January, 1878, at the age of sixty-five, having been born on the 19th February, 1812. For the last twenty-five years Mr. Murray has been a constant contributor to the scientific periodicals both of Scotland and England of articles upon entomological subjects; among these may be mentioned a report on the beetles of Scotland, published in 1852, and in the following year a catalogue of the same insects; monographs of the beetles of the family *Sphæridiidæ* and of the genera *Cercyon* (1853) and *Catops* (1856); descriptions of some insects from the Rocky Mountains in 1853; descriptions of new Coleoptera from the Western Andes and the neighbourhood of Quito in 1855, 1856 and 1857; a numerous series of articles on the Coleoptera of Old Calabar, on the West Coast of Africa (published in the 'Annals of Natural History,' 1857—59); the first part of a very extensive monograph of the family *Nitidulidæ* (in the 'Transactions' of the Linnean Society); a curious paper on the species of *Pediculi* infesting the different races of men (in the 'Transactions' of the Royal Society of Edinburgh, 1860). As an entomologist he will, however, be longer and more generally known by his labours in establishing the entomological department of the Museum of Science and Art, now transferred to the Bethnal Green Museum, in which a very curious and extensive series of the beneficial and destructive species of insects has been collected, with specimens of the injurious effects of the latter on the objects which they attack, illustrated by highly magnified coloured figures, forming a very valuable Museum of Economic Entomology. This collection it was intended should form the basis of a series of handbooks on the economy of insects, of which the first, devoted to the Linnean *Aptera*, or wingless species, has only been hitherto published. Mr. Murray also published a large quarto volume on the geographical distribution of Mammals (1866), with 103 maps, and was well known as a good botanist and a monographer of the genus *Pinus*, published in the 'Gardeners' Chronicle,' to which he was latterly a constant contributor.

James Scott Bowerbank, LL.D., F.R.S., L.S., G.S., &c., one of the original founders of our own Society, as well as of the Palæontological and Microscopical Societies, and (in conjunction with Dr. Johnston) of the Ray Society, was born on the 14th July, 1797, and died on the 9th March last. Although more especially devoted to the structures of sponges and flints, upon which he

Digitized by Google

published several memoirs in the 'Philosophical Transactions' and other works (his views in which were keenly opposed by Dr. J. E. Gray), he published two papers in the 'Entomological Magazine' on the circulation of blood in the wings of the *Ephemeridæ*, and one on the scales of the wings of Lepidoptera in the same work.

We have to regret the death of WILLIAM ARNOLD LEWIS, F.L.S., by a fearful accident on one of the Swiss mountains on the 6th September last. His decided opposition to the constant alterations in the nomenclature of Lepidopterous insects, made on the doubtful and often improperly overstrained ground of priority, was manifested by the publication of an extensive article on that subject in the 'Transactions' of our Society.

Mr. E. W. ROBINSON, an excellent and well-known entomological engraver, born on the 20th January, 1835, died on the 10th August last.

HENRY ADAMS, a distinguished Conchologist, and one of the members of our Society, also died during the past year.

A genially written biographical notice of the late HENRY DOUBLEDAY, by Mr. Dunning, with a small but characteristic photographic likeness, appears in 'The Entomologist' for March, 1877.

I regret that, in the Obituary in my last year's Address, I omitted to record the death of CHRISTIAN WILLIAM LUDWIG EDUARD SUFFRIAN, the distinguished Coleopterist, which took place on the 18th August, 1876. A biographical notice and a complete list of his entomological writings, is given by Dr. C. A. Dohrn, in the 'Stettiner Ent. Zeitung,' 1877, pp. 106—117. His various memoirs on the European *Œdemeridæ* and on the family *Cryptocephalidæ* are indispensable to the student.

Several large collections of insects have, during the past year, been dispersed by auction by Messrs. Stevens, including those of Mr. Edwin Brown and Mr. Trovey Blackmore (whose deaths I had to record in my last year's Address), and to these may be added the collection of Mr. Francis Walker. In the first of these sales some high prices were obtained for rare insects, of which a notice is given in the 'Entomologist's Monthly Magazine' for April last (p. 257). These prices, however, are by no means equal to those realized at

Digitized by Google

the sales of Drury and Francillon's collections, of which priced lists are preserved in the Hopeian Library of Entomology at Oxford.

Commencing the scientific part of my report with the earliest insect formations with which we are acquainted, I shall next notice the more recent views of Evolutionists, &c., and then proceed to memoirs on the Anatomy, Metamorphoses, Economy, and Descriptions of the various Orders of Insects.

Fossil Entomology.

A series of articles on fossil insects, by Mr. Herbert Goss, F.L S., F.Z.S., has been read before the Brighton and Sussex Natural History Society, on the 9th March, 15th June and 9th November last, published in the local journals of Sussex. In the first of these the writer described the various formations of the recent and tertiary periods, and the insect remains found therein; in the second paper he treated of the formations of the secondary period, including the upper oolite, the lower oolite, the lias and the trias, and their fossils; and in the third he described the primary formations and their remains, including those of the coal measures, in which alone in this country fossil insects had been found. The Devonian shales of New Brunswick were the oldest strata in the world in which any traces of insect life had been discovered, none having been found in the Silurian, Cambrian or Laurentian formations. It was remarkable that until quite recently all the fossil insects were referable to the existing orders, and often to known genera of insects, the only exception being the singular *Eugereon Böckingii* of A. Dohrn, which exhibits the characters both of Hemiptera and Neuroptera, and was thence considered by its describer as the progenitor of those orders. To this insect have been added two or three species from America, referred by Mr. Scudder to the Neuroptera, one species from Belgium and several new ones which have been formed into a separate order (Palæodictyoptera) by Dr. Goldenberg, in his 'Fauna Sarœpontana fossilis' (1877). The writer considered from this fact that it was evident that the geological record was not nearly old enough or perfect enough to afford much direct evidence in support of the theory of Evolution of insects of the existing orders from inferior organisms.

Digitized by Google

Mr. Goss's lectures are to be published in the Transactions of the Geologists' Association.

The Trustees of the British Museum have published 'A Catalogue of British Fossil Crustacea, with their synonyms and the range in time of each Genus and Order,' by Henry Woodward, F.R.S. (8vo, 1877), in which are recorded 197 genera and 1051 species and varieties found fossil in Britain, whereas in Prof. Morris's 'Catalogue of British Fossils,' published in 1854, there were only 81 genera and 306 species indicated. The great majority of the species are referable to the *Trilobites* and *Ostracoda*.

In the 'Primæval World' of Dr. Heer, of Zurich, 876 species of fossil insects are described.

In the 'Geological Magazine' for February, 1877, a restored figure of a fossil cockroach is given; Mr. Etheridge has also described *Eurypterus Stevensoni* from the lower carboniferous series of Berwickshire; and Mr. Woodward has an article on *Anthrapalæmon* from the coal measures (= *Apus dubius*, M.-Edwards). The same number also contains an article by Mr. Dawson on a new species of the same genus from Nova Scotia and on *Homalonotus Dawsoni*.

We are indebted to Mr. J. H. Scudder for a continuation of his memoirs on the fossil insects of the American tertiary beds of the White River, of which former portions, including the Coleoptera and Physopoda, have appeared in the 'Proceedings' of the Boston Society of Natural History (vols. x. and xi.), the 'American Naturalist' (vols. i. and vi.), the 'Geological Magazine' (vol. v.), and in Hollister's 'Mines of Colorado.' In the present article, published in the 'Bulletin of the United States Geological and Geographical Survey' (vol. iii., August, 1877), the Hymenoptera (three species only), a considerable number of Diptera, especially referable to the *Tipulidæ*, including several new genera, various Coleoptera, five Hemiptera, several Physopodans, and one *Phryganea* are described. In a subsequent article, published in the same work, Mr. Scudder has described two fossil *Carabidæ*, belonging to the genera *Loricera* and *Loxandrus*, from the glacial and interglacial strata of Toronto.

The fossil insects of the tertiary beds at Quesnel, in British Columbia, collected by Mr. G. W. Dawson, have been described by Mr. S. H. Scudder, in the 'Report of Progress of the Geological

Digitized by Google

Survey of Canada' (1875-76), and are stated to be better preserved than any that have been obtained from other American localities. The species are *Formica arcana*, *Pimpla senecta* and *decessa*, *Calyptites antediluvianum* (Braconidæ), several midges (Chironomidæ), very imperfect, *Boletina sepulta* (Mycetophilidæ), *Brachypeza* (two specimens), and *Trichonta Dawsoni* (ditto), *Dolichopidæ* (several fragments), and several species of Muscidæ of different genera; *Prometopia depilis* (Nitidulidæ), *Lachnus petrorum* (Aphidæ), and portions of one of the Libellulidæ.

A note on certain insect remains, chiefly Libellideous and Blattideous, from Cape Breton, by Mr. S. H. Scudder, is published in the 'Proceedings of the Boston Society of Natural History' (vol. xviii.).

Descriptions, with figures, of two fossil caterpillars of *Satyridæ* are published by M. Daudet, in Rev. & Mag. Zool., 1876, pl. 11.

An insect which appears to belong to the interesting family *Stylopidæ* has been found in amber, and described by Menge in the 'Schriften' of the Nat. Hist. Soc. of Dantzig, and is noticed in the Ent. Mo. Mag., June, 1877.

Evolution, Parthenogenesis, Mimicry.

A paper, by Mr. Packard, opposing Mayer's views upon the Ontogeny and Philogeny of Insects, appears in the 'Monthly Microscopical Journal' for February, 1877.

A notice of Dr. Weismann's remarkable memoir on the genetic character of the markings of the larvæ of *Sphingidæ* appeared in 'Nature,' March 22, 1877.

The 'Proceedings of the Academy of Natural Sciences of Philadelphia' contain a recent paper, by Thomas G. Gentry, on the genetic Philogeny of Lepidoptera, illustrated by an arboreal diagram, in which these insects are assumed to have been derived from the aquatic Trichoptera through *Paraponyx*, with *Arctica* as the progenitor of the order.

Mr. S. H. Scudder has published an article upon the "Classification of butterflies, with special reference to the position of the *Equites*, or Swallow-tails," in the 'Transactions of the American Entomological Society' (vol. vi.). Adopting the principles of Evolution, the author assumes that the Nocturnal Lepidoptera are the progenitors of the Diurna, which he divides into four families only, *Nymphales*, *Rurales* (Erycinidæ and Lycænidæ),

Digitized by Google

Papilionidæ and *Urbicolæ* (Hesperidæ), which last group he considers were "first separated from the common stock, and never developed to a high degree, since they still remain by far the lowest of the group, and are in many points more closely allied to some of the higher moths than they are to any other butterflies." An arborescent plan of the genealogy of the groups of butterflies is given, by which, as well as by the investigation of the various points of their structural differences, the highest place is given to the brush-footed butterflies, as has also been done by Bates, following the Germans, and followed by W. F. Kirby. Disagreeing entirely with this view of the relations of the families of butterflies, and regarding the Papilionidæ as the typical group, I must reserve my comments thereon for a future occasion.

The curious questions as to the parthenogenesis, dimorphism, and the occurrence of alternations of generation in certain European *Cynipidæ*, raised in Dr. Adler's memoir, which appears in the 'Deutsche Entomol. Zeitschr.' (vol. xxi., part 1), have formed the subject of an article by Mr. P. Cameron, published in the 'Scottish Naturalist' (October, 1877). Hartig first divided the gall-flies into (1) those which formed the galls, (2) those which inhabited galls formed by the former, and (3) those which are purely animal parasites. Of the first division eight of the genera are exclusively confined to the oak, and three to other plants; but amongst these Hartig found that in certain of the species there were [apparently] no males, thousands of specimens having been reared by competent observers all over Europe without a single male having been obtained; now the supposed unisexual individuals are mostly autumnal, whilst the bisexual ones are mostly vernal, the galls appearing with the young leaves and flowers, and the insects passing with great rapidity through their various stages; and Dr. Adler's hypothesis is that the spring forms give origin in the autumn, not to galls and insects like themselves, but to totally different galls which yield agamic forms very dissimilar to the spring ones, and these autumnal insects hibernate and lay eggs in early spring, which in due time yield the bisexual flies. Thus he states that *Spathogaster baccarum*, the maker of the common currant galls, oviposits in the young leaves, producing the well-known spangle galls of *Neuroterus lenticularis*, which in spring lays its eggs in the buds, giving issue to currant galls.

Digitized by Google

In this manner five other pairs of species are associated together by Dr. Adler—

Neuroterus fumipennis	with	*Spathogaster albipes*
„ *numismatis*	„	„ *vesicatrix*
Dryophanta scutellaris	„	*Trigonaspis megaptera*
„ *longiventris*	„	*Spathogaster Taschenbergi*
Aphilothrix radicis	„	*Andricus noduli*

Mr. Cameron insists that if such associations were true the two supposed species of each pair would appear in the same locality. An examination of what is known of these five supposed dimorphic species proves, however, that of the first four pairs the individuals are not found in the same localities, whilst of the last pair, although admitted by Mr. Cameron to be "undoubtedly found together" (that is, in the same locality), he has no hesitation in saying that they are by no means related in the way stated by Adler, *D. longiventris* being also pretty common in this country, whereas its supposed double, *S. Taschenbergi* has not yet been found here. Of *A. radicis* it has been fully proved that there is only one brood in the year, whilst the galls of its supposed double, *A. noduli*, appear in the spring, and the insects quit them in the autumn. Thus this pretty German theory is blown to the winds by the direct and well-continued observation of facts.

A curious phenomenon is mentioned by Mr. Cameron with one or two of the polythalamous gall-makers—namely, that from one gall only females will be produced, from another only males, but oftener both sexes will be found in the same gall. This observation has a very curious bearing on the variations of parthenogenesis, termed by Leuckart "Arrenotoky," and by Siebold "Thelytoky." The fact, however, of the existence of parthenogenesis has been fully proved by Mr. Cameron, not only in the *Cynipidæ*, but also in the *Tenthredinidæ*, of which numerous instances are given in the article under notice.

An article on the alternations of generations in the *Cynipidæ*, by M. Lichtenstein, appears in the 'Scottish Naturalist,' July, 1877.

Mr. Riley's memoir on *Nematus ventricosus*, contained in his 'Ninth Report,' makes us acquainted with the interesting fact that that species is subject to the variation of parthonogenesis in which male progeny only are produced by unimpregnated females,

Digitized by Google

and which has been termed "Arrenotoky" by Leuckart (the variation in which female progeny only are produced in many *Cynipidæ* having been termed "Thelytoky" by Siebold). This remarkable fact was observed nearly fifty years ago by R. Thom (Loudon, Gard. Mag., vii., p. 196), who, however, being loth to believe in anything so extraordinary as "lucina sine concubitu," thought that there must have been a connection between the male and female caterpillars, especially as he had often noticed these caterpillars with their tails curled around each other. The females of *Nematus ventricosus* lays its eggs on the surface of the leaf, and not in a groove formed by its saws, which are almost destitute of teeth, and which leads Dr. Riley to regard them as an instance of *defunctionation of special parts*, in which the teeth of the saw of the promordial sawfly have become degraded or reduced to almost nothing!

A case of parthenogenesis in a spider (*Segestria perfida*, Walck.) is recorded by Holmgren in the 'Organo de la Soc. Zool. Argentina,' tome ii., Entrega iv. (Cordova, 1877).

The wonderful modifications which occur in the development of many of the species of Aphides, especially those of the young *Phylloxera*, have continued to occupy the attention of M. Lichtenstein, who has published a *resume* of his observations in the 'Annals' of the Entomological Society of Belgium (vol. xix.), in which we find stated the anomalous fact that in certain groups, *Phylloxera* and *Rhizaphis*, some of the individuals are found in a partially winged state which is only transitory—"ne servant que de véhicule à la forme parfaite sexuée, un véritable cocon volant, si je puis m'exprimer ainsi." The small wingless Aphides produced from these winged "cocons volants" are destitute of rostrum, but furnished with organs of generation, "et s'accouplent dês leur naissance"! The following short table is given of this curious group, which, from a fancied analogy with the development of a flower, are termed

ANTHOGENETIC HOMOPTERA.

Insects characterized by a special pupiferous form, serving as an envelope from which the sexual specimens escape.*

* This "cocon volant" seems to me to be identical with the pseudo-nymph state of the *Ephemeridæ*.

Digitized by Google

I. Pupiferous form winged.
   a. PHYLLOXERA,* Boyer. Besides the pupiferous autumnal form there is a vernal parthenogenetic form. The species migrate from one kind of oak to another. The colonies are annual.
   b. RHIZAPHIS,* Planchon. Without any vernal winged form, but only parthenogenetic wingless individuals, which pass from the leaves to the roots, or live only on the roots, the colonies being perennial.

II. Pupiferous form wingless. ACANTHOCHERMES, Kollar, founded on a species inhabiting Austria and France, upon the oak.

Our 'Transactions' (1877, p. 265) contain a very important memoir, by Mr. J. P. M. Weale, on variations occurring in South African species of butterflies. The species especially noticed (of which extensive series were exhibited) were *Papilio merope* and its female varieties, *Acræa Esebria* (five distinct variations in coloration being described), *Junonia pelasgis* and *archesia*, and *Anthocharis Keiskamma*. Various experiments on feeding the larvæ of some of these variable species are recorded.

The modifications occurring in different species of butterflies produced at different seasons of the year (which in some species is so great as to have led to the different individuals being regarded as forming distinct species, and which formed the subject of a remarkable work by Dr. Weismann, noticed in my last year's Address) have been investigated by Mr. W. H. Edwards, whose memoir, containing "a history of *Phyciodes Tharos*, a polymorphic butterfly," appears in the 'Canadian Entomologist' for January, 1877. The eggs were obtained from the common wild aster (*N. Novæ-Angliæ*) in the Catskill Mountains, in July, 1875. A variety of experiments and observations on the different broods of this butterfly are recorded by Mr. Edwards, from which it appears that in the Catskills it is digoneutic, having two generations

* It is much to be regretted that the author has transposed these two generic names, giving to the destructive vine species the name of *Rhizaphis*, and that of *Phylloxera*, universally applied to the vine insects, to species found only on the oaks, the name *Rhizaphis* being especially inapplicable to an insect which partially lives on the leaves, and not exclusively on the roots, of the vine. If absolutely necessary, according to the inflexible (!) rules of nomenclature, to employ a separate name for the vine insect, it would have been convenient to have adopted the generic name *Peritymbia*, which I first proposed for the vine insect, and which would absolutely have had the priority if the Secretaries of the Ashmolean Society of Oxford had issued the 'Proceedings' of that Society as they ought to have been done.

Digitized by Google

annually, the first of which is *Marcia*, or the winter form, and the other is the summer form, and a certain proportion of the larvæ proceeding from the first hybernate (so far as appears), and all those from the second; whilst at Coalburgh, W. Virginia, there are four generations annually, the first being *Marcia*, the second and third *Tharos*, and the fourth mixed.

A further communication on the life-history of *Phyciodes Tharos*, by Mr. W. H. Edwards, in the subsequent number of the 'Canadian Entomologist,' has shown that not only *P. Marcia* and *Tharos*, but also *P. Phaon*, *Vesta*, and probably also *Batesii*, are to be regarded as periodical varieties of one variable species, of which Drury remarked, more than a hundred years ago, "Nature forms such a variety of this species that it is difficult to set bounds or to know all that belongs to it." The fact that variations in colour and markings correspond in this species with variations in periodicity have led Mr. Edwards to conclude that "When *Phaon* and *Vesta* and *Tharos* were as yet only varieties of one species the sole coloration was similar to that now common to the three. As they gradually became permanent, or, in other words, as these varieties became species, *Tharos* was giving rise to several sub-varieties, some of them in time to become distinct and well-marked, while the other two, *Phaon* and *Vesta*, remained constant." Dr. Weismann, commenting on Mr. Edwards' experiments and their results, observes, in a letter to him, "The case seems to me perfectly intelligible: *Marcia* is the old primary form of the species, and in the glacial period, the only one. *Tharos* is the secondary form, having arisen in the course of many generations through the gradually working influence of summer heat. In your experiments, cold has caused the summer generation to revert to the primary form. The reverting which occurred was complete in the females, but not in all the males. If so treated the summer brood of *Levana* will, in many more females than males, revert to the winter form. This sex is more conservative than the male—slower to change."

An instance of the so-called "mimicry" existing between insects of different orders, and in which a very striking resemblance exists between *Vespa orientalis* and a species of the dipterous genus *Laphria*, has been communicated to the Cambridge Philosophical Society (Proceedings, vol. iii., Feb. 1877). The author proposes to confine the term "mimicry" to cases of resemblance between

Digitized by Google

living objects, confining the term "protective resemblance" to those instances in which assimilation to stones, sticks, dead leaves, &c., exists.

An extended memoir on protective coloration in Nature, especially with reference to insects, by A. R. Wallace, has appeared in 'Macmillan's Magazine,' September, 1877; and has been reprinted in the 'American Naturalist.'

An abstract of Dr. Fritz Müller's memoir on mimicry in the genus *Leptalis*, alluded to in my last year's Report, has appeared in the 'American Naturalist,' September (vol. x., No. 9).

An interesting instance of the striking simulation to flowers, exhibited by living individuals of one of the Indian *Mantidæ*, *Gongylus gongylodes*, has been recorded by Dr. J. Anderson, in the 'Proceedings of the Asiatic Society of Bengal,' August, 1877. It is, however, only the under surface of the animal that exhibits this resemblance to a flower: the leaf-like expansion of the prothorax, instead of being green, is of a clear, pale lavender-violet colour, with a faint pink-bloom margin, and a blackish brown spot in the centre, thus resembling the opening of a tube in the middle of the corolla of a flower. A favourite position of the insect is to hang head downwards amongst a mass of green foliage, remaining motionless, or occasionally swaying about like a flower touched by a gentle breeze; and while in this attitude, its fore limbs banded violet and black, and drawn up in the centre of the corolla, render the simulation of a papilionaceous flower complete; and by this disguise act as a decoy to insects, which fly directly into the serrated, sabre-like raptorial arms of the simulator.

Anatomy and Physiology.

A valuable introductory work on the general structure of insects has been published by Dr. Vitus Gräber (small 8vo, pp. 403, with 200 excellent original woodcuts), under the title, 'Die Insekten, Erster Theil. Der Organismus der Insekten.'

Two articles on the development of the river crayfish, by Reichenbach, appear in Siebold and Kölliker's 'Zeitschrift' (vol. xxix.); and have been abstracted by T. J. Parker, in the Quarterly Journ. Microsc. Science (Jan. 1878). The investigations of the author are confined to the condition of the animal "in

Digitized by Google

ovo," in which six stages are recorded, the last being styled the Nauplius stage; but the links between this stage and the free state of the young animal, in which it resembles its parents, as shown by Herold, as well as the *Zœa* condition, remain yet unobserved.

A memoir on the respiration of land crabs, by M. Jobert, appears in the Annales Sci. Nat. (ser. vi. vol. iv.).

A note, by Dr. H. Wayenbergh, on a mortal case occurring from the bite of *Segestria perfida*, Walck., is published in the 'Boletin de la Academia Nacional de Ciencias' (vol. ii., Cordova).

A memoir, by M. Plateau, on digestion and its organs in the *Phalangiidæ*, is noticed in the Annals Nat. Hist. for March last; as is also an article, by M. Magnin, on the power of fasting during long periods possessed by some species of *Acaridæ*.

Descriptions of a number of coleopterous monstrosities are published, with figures by Dr. Kraatz, in the Deutsch Entomol. Zeitschr. for 1877, consisting of malformations, retarded developments, or duplication, or even triplication, in some portions of the limbs.

A memoir on the anatomy of the digestive apparatus of the Orthoptera, by Wilde, appears in the Archiv. f. Naturg. (43rd year, Heft 2).

An abstract of Mr. Wood-Mason's observations, on the development of the antennæ in the pectinicorn *Mantidæ*, appears in the Proc. Asiat. Soc. of Bengal, December, 1876, showing the mode in which the bipectinations of the male insect are developed at the last shedding of the chitinous membrane of the pupæ.

Mr. J. Wood-Mason has also given a short notice of a new and remarkable species of *Phasmidæ*, from Borneo, which appears to possess, in the perfect state, structures which seem fitted both for aërial respiration and respiration by tracheal gills, in the shape of small, oval, ciliated plates, such as co-exist in *Pteronarcys regalis*. For this curious insect he proposes the name of *Cotylosoma dipneusticum* (Ann. Nat. Hist., 5 S., vi. p. 102).

A memoir upon the generative organs of the *Ephemeridæ* has been presented to the Academy of Sciences, Paris, by M. Joly, of which an account is given in the 'Comptes Rendus,' October, 1876; noticed in Annals Nat. Hist., February, 1877.

Digitized by Google

An article on the suspension of the power of flight in bees, by Dönhoff, in the Archiv. Sc. Phys. et Natur., is noticed in 'Nature,' April 26, 1877.

A memoir on the structure of the brain in *Apis*, *Gryllus*, *Gryllotalpa*, *Carabus* and *Astacus*, by Dietl, appeared in the Zeitschrift f. wissensch. zool. (vol. xxvii., part 4).

The stridulating powers of insects have recently attracted considerable attention, both at home and abroad. In addition to the discovery of this power in a large Indian species of spider, by Mr. J. Wood-Mason, already mentioned, and of which a notice is given, with a characteristic figure of the specimen in the act of stridulating, by the author, in the Trans. Ent. Soc. Lond., 1877, the same author has, in the same work, announced the discovery of stridulating organs, not only in a species of scorpion, but also in certain Crustaceans and in a large species of *Phasmidæ*.

The musical apparatus of the *Cicadæ* has been studied by Paul Mayer, whose memoir, with figures, appears in Siebold and Kölliker's 'Zeitschrift' (vol. xxviii. Heft 1, 2). A paper by Mr. Galton, on the same subject, appears in the 'Popular Science Review' (n. s., vol. i.); and another by M. Carlet, in Ann. Sci. Nat. Zool. (6 ser., vol. v.).

Various articles on the stridulation of other insects have appeared in the 'Entomologists' Monthly Magazine,' vol. xiii., pp. 169 (*Vanessa*), 207 (*Ageronia*), 208 (*Vanessa*), 217 (*Acherontia*), 230 (various), 273 (various moths).

Mr. Swinton has also published an article on the stridulation of the *Cicadæ*, in the Ent. Mo. Mag. (September, 1877); and has also described stridulating organs in various Hemiptera, in the same work (vol. xiv., p. 29). and in different Hymenoptera, in ditto (vol. xiv., 187).

An article on a supposed auditory organ in nocturnal Lepidoptera at the base of the abdomen, by Mr. Swinton, appears in the Ent. Mo. Mag. for November, 1877.

The minute anatomy of various organs of ants, illustrated by four coloured plates, formed the subject of the first Quekett Lecture, delivered by Sir John Lubbock before the Royal Microscopical Society, in April, 1877, published in the 'Monthly Microscopical Journal,' September, 1877.

A curious memoir by Fritz Müller, entitled, "Die Stinkkölbchen der weiblichen Maracujá falter," has appeared in Von Siebold

Digitized by Google

and Kölliker's 'Zeitschrift,' November, 1877, with numerous illustrations of the small, clavate, and remarkably setose and strong-smelling appendages [called *Osmateria* by Kirby] placed at the extremity of the bodies of the females of the genera *Heliconius*, *Eueides*, *Colænis*, and *Dione* (= *Agraulis*), which have received the names of Maracuja butterflies, from the food-plant of their larvæ. By the possession of these organs, and by a variety of other peculiarities, detailed by the same author in an article in the Stettin Ent. Zeit., December, 1877, the author has satisfactorily shown that these four genera ought no longer to be associated with the *Heliconiidæ* and *Nymphalidæ*, but together form a separate group. These two articles are of much interest in connection with the question as to the cause of the so-called mimicry of many *Heliconiidæ* (supposed to be owing to the bad odour of the latter, most of which, however, want this stinking organ) by other butterflies, as well as with reference to the name of the remainder of the family, from which the supposed typical genus is thus removed.

Economic Entomology.

The ninth annual report on the noxious, beneficial and other insects of the State of Missouri, made to the State Board of Agriculture, pursuant to an appropriation for this purpose from the Legislature of the State, by Dr. C. V. Riley, "State Entomologist," has appeared. It contains, as usual, admirably illustrated memoirs on the different species studied during the preceding year, which are as follows:—the Gooseberry Span-worm, *Eufitchia ribearia* (Geometridæ); the imported Currant-worm, *Nematus ventricosus*, Klug (Tenthredinidæ); the native Currant-worm, *Pristiphora grossulariæ* (Tenthredinidæ); the Strawberry-worm, *Emphytus maculatus* (Tenthredinidæ); Abbot's White Pine-worm, *Lophyrus Abbotii* (Tenthredinidæ); Leconte's Pine-worm, *Lophyrus Lecontei* (Tenthredinidæ); the Colorado Potato-beetle (Chrysomelidæ); the Army-worm, *Leucania unipuncta* (Noctuidæ); the Wheat-head Army-worm, *Leucania albilinea* (Noctuidæ); the Rocky Mountain Locust, *Caloptenus spretus* (Acrididæ), occupying more than half the volume; the Hellgrammite, *Corydalis cornutus* (Sialidæ); and the Yucca-borer, *Megathymus Yuccæ* (Hesperidæ).

Mr. Wollaston has made us acquainted with a new insect-pest at Madeira (Ann. Nat. Hist., October, 1877), which threatens to

Digitized by Google

be very destructive to the banana trees in that island. It is *Calandra* (*Sphenophorus*) *striatus* of Fabricius, which has been taken "in fabulous numbers" on the trunks of that tree, and of which Mr. Wollaston himself took as many as fifty specimens in a few minutes, the larvæ feeding deeply in the interior of the trees, and the perfect beetles eating grooves for their exit to the surface of the stems. The species appears to be a native of Brazil, although specimens have been also received from India, Tasmania and Japan, and it is clear that it has been introduced into Madeira within the last twenty years.

A memoir by Dr. Hagen on the possible mischief likely to result in the United States by the extension of the ravages of the species of White Ant, *Termes flavipes*, and of the most advantageous measures to be adopted against its inroads, is published in the 'American Naturalist' for 1876.

The account of the injuries done to the eggs of fish, at Cannara, in India, by *Corixa ovivora*, published by myself in our Transactions some years ago, has been supplemented by a statement, made at the last meeting of the Natural History Society of Görlitz, that the spawn of the Carp are attacked by the *Ranatra linearis*, which sucks the blood out of the young organism; the only successful mode of preventing the mischief being to drain the pools and restock them with fish.

A curious notice of the different species of insects introduced into America with the goods and packages sent to the International Exhibition of Philadelphia was given, by Prof. C. V. Riley, in the 'Proceedings of the Academy of Sciences of St. Louis' (October, 1876). A Committee was subsequently formed, with Dr. J. L. Leconte as Chairman, for the purpose of drawing up an account of these different introduced species, and their report is published in the Proc. Acad. Nat. Sc. Philad. (Nov. 1876), in which thirteen species of beetles, two *Tineidæ*, four parasitic Hymenoptera, and various small Coleoptera, mostly found in mouldy specimens of straw goods from Italy are described.

The Colorado Beetle (*Doryphora decemlineata*), which has committed such extensive ravages on the potato crops of North America, has been the fruitful source of popular publications during the past year. The Prussian Government led the way by having small models of the insect in its different states, and of the potato-stem and leaf, extensively distributed; and the Privy

Digitized by Google

Council in our own country expended a large sum in distributing magnified illustrations of them all over the country. Dr. Charles V. Riley's memoir, with its plate, has been republished in this country by Messrs. Routledge ('The Colorado Beetle, with Suggestions for its Repression, and Methods of Destruction,' 12mo, 1877), a compilation from which, by Dr. Andrew Wilson, was also published in Edinburgh, by Messrs. Johnson. Dr. Stål has also issued a small pamphlet with the title 'Om Colorado Skalbaggen.'

The natural history of the Rocky Mountain locust (*Caloptenus spretus*), and the habits of the young or unfledged insects, as they occur in the more fertile country in which they will hatch during the present year, form the subject of the first two numbers of the 'Bulletin of the United States Entomological Commission,' issued by the Government Printing Office at Washington (8vo, 1877).

Prof. C. V. Riley has also published an elegant little volume entitled 'The Locust Plague in the United States, being more particularly a Treatise on the Rocky Mountain Locust, or so-called Grasshopper, as it occurs east of the Rocky Mountains, with practical recommendations for its destruction' (8vo, Chicago, 1877), in which the entire history of this very destructive insect, in all its stages, is detailed at full length, with excellent illustrations.

A note, by Dr. H. Weyenbergh, upon the useful properties of *Mantis precaria*, has been published in the 'Anales de la Republica Argentina' (t. iv.).

'On the Habits of Ants' is the title of a pamphlet (large 8vo, 20 pages), published by Sir John Lubbock, full of interesting particulars of the economy of these insects, "which have a fair claim to rank next to man in the scale of intelligence, although the anthropoid apes no doubt approach nearer to him in bodily structure."

Sir John Lubbock has also, with wonderful perseverance, the more remarkable from his numerous other and more important avocations, continued his observations on the habits of ants, published in the 'Journal of Proceedings of the Linnean Society.' The various chapters of this fourth memoir are devoted to—

1. The want of ingenuity in crossing chasms.
2. Experiments testing intelligence.

Digitized by Google

3. As to power of communication.*
4. Individual influence on character.
5. Intelligence and affection.
6. Experiments on ants under chloroform and intoxicated.
7. Recollection of friends.
8. Experiments with ants of different nests.
9. Contrast in behaviour of different kinds of ants.
10. Suspected cannibalism.
11. Experiments testing the senses, sight and hearing.
12. Dependence on slaves.
13. Division of labour, with a wonderful series of tables.
14. Parthenogenesis in ants.
15. Parasites of, and on, Ants, with technical descriptions of a new species of *Phora*, and a new genus allied thereto.

An excellent coloured plate of the five species of ants experimented upon accompanies this most interesting memoir.

A memoir, by M. Collin de Plancy, on certain dipterous insects parasitic on toads, appears in the 'Bulletin' of the Soc. Zool. de France, 1877. The author gives a detailed account of the various instances already published by different authors† of the occurrence of Muscideous parasites on these Batrachians, and describes several other instances in which toads have been found with large wounds under the eyes infested with dipterous larvæ of the genus *Lucilia* (*L. bufonivora*), which he believes had laid their eggs in already formed wounds.

This memoir of M. de Plancy is followed by another, 'Sur des Diptères Parasites de la *Rana esculenta*,' by M. E. Taton. In

* The observations on this head clearly show that the ant experimented on had announced to her friends the discovery of a supply of food, although she had not told them the way to it.

† Moniez, in 'Bull. Scient. Hist. et Litter. du Departm. du Nord.' Fevrier, 1876.
De Borre, in 'Comptes Rendus,' Ser. ii., No. 30, p. 6.
M. Girard, in 'Bull. Sceanc. Soc. Ent. France,' Nov. 1876, Dec. 1876, Jan. 1877, and May, 1877.
Taton, in 'Bull. Sceanc. Soc. Ent. France,' May, 1877.
Boie, in 'Verh. Zool. Bot. Ges. Wien.,' 1865, p. 241.
Lelièvre, in 'Bull. Sc. Dep. du Nord,' Aug. & Sept. 1876.
De la Fontaine, 'Reptiles,' Luxembourg edit., 1870, p. 37.
Selys-Longchamps, in 'Soc. Ent. Belge,' 7 Oct. 1876.
McLeay, in 'Trans. Ent. Soc. N. S. Wales,' vol. i., 1863.
Another memoir on the existence of a *Sarcophila* parasitic on man, especially children, and other animals. 'Horæ Soc. Ent. Ross.,' and 'Soc. Linn. du Nord de France,' 1 April, 1877, tome iii., p. 241.
Lucas, in 'Ann. Soc. Ent. France,' 1851, Bul., p. lxiii.

Digitized by Google

this memoir M. Taton describes some experiments made upon frogs in order to discover whether the wounds of the Batrachians infested with larvæ owed their existence to the eggs having been deposited by the parent fly on the sound skin of the frogs, or in previous wounds, the result of which showed that the parasite larvæ only infested previously made wounds. Two, if not three, distinct species of *Muscidæ* were reared by M. Taton and M. Girard, including *Sarcophaga nurus*, Rondani (*hæmorrhoidalis*, Meig.), and *S. setinervis*? as determined by M. Bigot.

A peculiar kind of industry, that of breeding maggots, has lately been tried in Paris. Over the soil were spread large quantities of stale fish, dead lobsters, odorous poultry, &c. The maggots, which soon became abundant, were carefully picked out, and packed in casks of galvanized iron, and finally sold for fish-bait and chicken food. The remaining refuse was converted into manure. The industry having become an intolerable nuisance in the neighbourhood was put a stop to by the police. ('Nature,' Aug. 9, 1877.)

A short article on the mode of life of the larvæ of a species of *Phryganea*, by Signor Silva de Bell Ville, has appeared in the 'Organo de la Soc. Zool. Argentina,' tome ii., Entrega iv.

A curious instance of supposed Commensalism in larvæ, as distinguished from Parasitism, is recorded by Fritz Müller, in 'Nature' (Jan. 12, 1877). I have added a copy of this article to my paper on "Lepidopterous Parasitism" (Trans. Ent. Soc. 1877),

The agency of insects in effecting the impregnation of flowers has recently attracted much attention; and we find an entire chapter devoted to the subject in Mr. Darwin's remarkable work on 'The Effects of Cross- and Self-fertilisation in the Vegetable Kingdom,' in which the perforation of flowers by bees for the purpose of obtaining the nectar, and the effects thereby produced on the fertilisation of the flowers, is dwelt upon at great length.

The former work of Mr. Darwin's on the fertilisation of Orchids, Sir John Lubbock's little work 'British Wild Flowers,' and a memoir by Müller in 'Bienen Zeitung' for June, 1876, enter upon the same curious question; and various articles on this subject have appeared in 'Nature' during the past year, by Hermann Müller.

A memoir, "On certain relations between plants and insects, including not only the modes of attraction, but the means of

Digitized by Google

defence which have been elaborated by plants, and also the influence exercised by plants on insects," was read by Sir John Lubbock, before the Society of Arts, on February 23rd, 1877, in continuation of his little work on the same subject, and is published in the 'Journal' of that Society (vol. xxv., p. 281). In this memoir the author has entered into the curious questions as to the colours and markings of the larvæ of the elephant hawk-moth (*Chœrocampa elpenor*), raised by Dr. Weissmann; and also on the curious connection between the larvæ of *Sitaris* and honey, as investigated by M. Fabre.

The question of the selection of particular species of flowers by individual specimens of bees or other insects, having for its object, not supplying the wants of the insect, but the fertilisation of the plant, has formed the subject of several communications to 'Nature' (vol. xvii. pp. 102, 163); an anonymous writer maintaining that when pollen-grains of different colours and of different species of plants are found on the thighs of an *Andrena*, the plants visited by the insect must have been those the admixture of whose pollen would induce cross-fertilisation.

In an article on honey-dew, by Dr. Hoffman, of Giessen, it is asserted that that secretion is not produced by *Aphides* or other insects, but is purely vegetable in its origin ('Nature,' Feb. 8th, 1877).

Geographical Distribution.

During the past year we have been made acquainted with the establishment of another Academy of Natural Sciences in the United States, at Davenport; and in the first volume of the Proceedings of which Academy are published a series of papers on North American insects, namely:—

1. Notes on the maple-bark louse [or scale], *Lecanium acericola* of Walsh and Riley, a scale insect which has been found very injurious to the maple trees in Davenport, Iowa.
2. List of Coleoptera found in the vicinity of Davenport.
3. List of Lepidoptera collected in the vicinity of Davenport.
4. List of Coleoptera collected on the Rocky Mountains of Colorado.
5. List of Lepidoptera collected in Colorado, with dates and localities.
6. Report on the insects collected by Capt. Jones' expedition

Digitized by Google

to North Western Wyoming: — Lepidoptera, Hymenoptera, Coleoptera, and Neuroptera; with dates and localities.

All the preceding memoirs are by J. D. Putnam.

7. List of Hymenoptera collected by J. D. Putnam; with descriptions of two new species, *Nomada Putnami* and *Anthophora albata*. By E. T. Cresson.

The Proceedings of the Linnean Society contain an abstract of a memoir, by Mr. M'Lachlan, of the insects collected in the late Arctic Expedition. A notice of this paper has appeared in 'Nature' of the 22nd December last.

The Annulosa collected at the Duke of York Island, New Ireland, and new Britain, have been described in the Proceedings of the Zoological Society, 1877 (part 1), as follows:—The Crustacea (sixteen species), by E. J. Miers; the Lepidoptera (forty Rhopalocera and ten Heterocera, including *Alcides aurora*, pl. 23, figs., 5, 6), by Messrs. Salvin and Godman; and the Coleoptera (forty-four species, including new species of *Dipelicus*, *Oryctoderus*, and *Batocera*), by H. W. Bates.

The collections of articulated animals, found at the Galapagos Islands during the visit of H.M.S. 'Petrel,' have been described in the Proceedings of the Zool. Soc. for 1877:—The Crustacea (four species), by E. J. Miers; the Myriapoda and Arachnida (seven species), by A. G. Butler; the Coleoptera (including several new genera), by C. O. Waterhouse; the Hymenoptera (five species) and Diptera (one species), by F. Smith; the Neuroptera, by R. M'Lachlan; the Lepidoptera (two species), the Orthoptera (six species), the Hemiptera (nine species), and the Homoptera (nine species), by A. G. Butler.

Some notes, by Mr. W. Macleay, on the Entomology of New Ireland, have been published in the Proceedings of the Linnean Society of New South Wales (vol. i., part 4).

Mr. R. M'Lachlan has called attention (in 'Nature,' vol. xvii., No. 162, December 27, 1877) to the remarkable fact, having reference to the geographical distribution of animals, that in Chili and the extreme southern portion of South America there are found several well-marked palæarctic or nearctic forms not found otherwise in America, South of Mexico, and equally unknown in the southern hemisphere of the Old World. Such are the genera —*Carabus*, *Argynnis*, and *Colias*—to which Mr. M'Lachlan adds several Trichoptera, of the family *Limnophilidæ*, which are rich

Digitized by Google

in species in the northern regions and also in Chili, Araucania, and the Falkland Islands, but not elsewhere South of Mexico in the New World, nor of the Himalayas in the Old World. Mr. M'Lachlan accounts for this by supposing that at the close of the northern glacial epoch a few stragglers of these groups, instead of wending their way northwards, mistook the points of the compass, and went southwards. Mr. Wallace has replied to this article in a subsequent number of 'Nature.'

"A Cosmopolitan Butterfly; its Birthplace and Natural History," is the title of a memoir, published by Mr. S. H. Scudder, in the 'American Naturalist,' 1876. *Vanessa Cardui* is the only butterfly whose range is so extended as to be termed cosmopolitan; and the enquiry as to its exact range, its natural history, its migrations, the variation of the periodicity in different seasons and in different countries, and the distribution of its plant-foods, has resulted in several interesting points of general interest.

Memoirs containing descriptions of insects of various orders and families inhabiting different countries are noticed in the portion of this Address devoted to

Descriptive Entomology.

Crustacea.

The first number of the 'Bulletin of the Natural-History Society and Museum of Illinois' contains a paper, by S. A. Forbes, on the Crustacea of that State, including twelve species of *Cambarus* (three of which are new), two species of *Crangonyx*, and three *Gammari*.

Descriptions of two new species of Crustacea from New Zealand, *Trichoplatus Huttoni* (= *Halimus Hector*, Murs.) and *Acanthophrys Filhoti*, are published by M. A. M. Edwards, in Ann. Sc. Nat. (ser. vi., vol. iv.).

The Crustacea, collected by the Rev. G. Brown "*on* Duke of York Island," have been catalogued and described by Mr. Edward J. Miers (Proceed. Zool. Soc., February 20, 1877). They represent sixteen species, none of which are new to Science, and belong to well-known forms, generally distributed throughout the Indo-Pacific region.

The same author has also published descriptions and figures

Digitized by Google

of the Crustacea of Kerguelen-Land (Transit of Venus Expedition, Zool., pl. xi.); and also of a small interesting new species of crab belonging to the *Oxystomata*, although bearing a strong resemblance to certain *Cancridæ*, under the name of *Actæomorpha erosa*, from Australia (Proc. Linn. Soc. Zool., vol. xiii., pl. 14).

The position of the Anomourous division of the decapod *Crustacea* has been the subject of much discussion, including as it does groups of great diversity, the hermit crabs differing most widely from the *Hippidæ*. A small species, *Hippa talpoida*, found along the whole of the eastern coast of the United States, has furnished the subject of a memoir by Mr. Sidney Smith, of Yale College, in the Transactions of the Connecticut Academy (vol. iii. p. 311). This species passes through a larva state similar to *Zœa*, but destitute of a large dorsal spine. They then assume the *Megalopa* form, with large eyes, and powerful, abdominal swimming legs, but burying themselves in sand with great alacrity. Hence the embryonic development of *Hippa*, like that of *Albunea*, studied by Claus, agrees much more with the *Brachyura* than with the *Paguri* and lobsters.

An account of the Crustacea collected by the Rev. A. E. Eaton at Spitzbergen has been published by Mr. Miers, in the Annals Nat. Hist., February, 1877.

A memoir, by E. J. Miers, on the *Leucosiadæ* and on *Matuta*, appears in the Transactions of the Linnean Society (2nd ser., vol. i. pl. 5).

A memoir, by Alois Humbert, on blind Crustacea (*Niphargus* and *Crangonyx*), in which the conclusions of Rougemont are opposed, appears in the Archiv. Sci. Phys. et Natur. (Ann. Nat. Hist., March, 1877).

"Notes on Sessile-eyed Crustacea," by Rev. T. R. R. Stebbing (Annals Nat. Hist., ser. 5, vol. i. p. 31), including descriptions and figures of a new species of *Caprella*, dredged at Salcombe, *Stimpsonia chelifera*, Sp. Bate and Westw.; and notes on other Amphipodous Crustacea.

Descriptions of new and little-known Amphipodous Crustacea, *Amphilochus concinna*, *Danaia dubia*, *Callimerus acutidigitata*, and *Cratippus* (*Exunguia*) *stilipes*, all from Torbay, are also described by Mr. Stebbing, in Ann. Nat. Hist. (4th ser., vol. xviii. p. 443).

V. Lilljeborg, 'Synopsis Crustaceorum suecicorum ordinis *Branchiopodorum* et subordinis *Phyllopodorum*.' Upsala.

Digitized by Google

A memoir, by Kurz, on the *Lernæopodidæ*, appears in Siebold and Kölliker's 'Zeitschrift' (vol. xxix. Heft 3).

A curious memoir on the anatomy and transformations of the parasitic crustacean, *Tracheliastes polycolpus*, with three plates, appears in Siebold and Kölliker's 'Zeitschrift' (vol. xxix. pl. 1).

An extended memoir, by Dr. Weismann, on the "Naturgeschichte der Daphnoidea," with especial reference to the embryology of the species, appears in Siebold and Kölliker's 'Zeitschrift' (vol. xxviii.), illustrated by five large plates.

A memoir, by Drs. Weismann and Gräber, appears in the 'Bericht' of the Freiburg Society of Naturalists, on the crustaceous family *Daphniadæ*, noticed in 'Nature,' October 11, 1877.

Arachnida.

Prof. Lebert has contributed an elaborate memoir, on the spiders of Switzerland, to the general Swiss Society of Natural History of Zurich, and which entirely occupies the second part of its 'Transactions' for the past year.

The spiders of Hungary form the subject of a handsome royal 4to volume, with three plates, forming part of the 'Transactions of the Royal Hungarian Natural History Society,' by the assistant director, Otto Hermann, of Buda Pest. This first volume treats of the bibliography of the tribe, and the life-history of spiders in general, as well as the geographical distribution of the Hungarian species, the technical description of which will occupy a second volume.

An extensive list, with descriptions, of the spiders and other Arachnida of the Argentine Republic, by E. L. Holmberg, has appeared in the 'Anales de Agricultura de la republica Argentina' (vol. iv.), which has also been separately published, but without the plates, by the Sociedad Cientifica de Buenos Aires, and in the 'Periodico Zoologico' of the Sociedad Zoologica Argentina (Cordoba, 1877). The species described are *Isometrus fuscus*, *Bothriurus vittatus*, Guer.; *Telegonus* (two species) and *Cercophonius* (one species) belonging to the *Scorpiones*; *Pachylus* (two species) and *Ostracidium* (one species) belonging to the *Opiliones*, and one species of *Chelifer*. This memoir has been republished in the 'Boletin de la Academia Nacional de Ciencias' (tom. ii.).

Digitized by Google

The Araneides of the Chevert Expedition have been described by H. H. B. Bradley, in the Proceedings of the Linnean Society of New South Wales (vol. ii. part 2).

A list of the spiders captured in the Seychelles Islands by Prof. E. P. Wright, with descriptions of species supposed to be new to arachnologists, by John Blackwall, F.L.S., accompanied by notes by the Rev. O. P. Cambridge, has been published in the 'Proceedings' of the Royal Irish Academy (August, 1877), with two excellent plates by Mr. Tuffen West. Four species of *Salticus*, one *Lissomanes*, one *Thomisus*, one *Olios*, one *Sparassus* (?), one *Clubiona*, one *Theridion*, one *Argynodes*, three *Epeiræ*, one *Nephila*, and two *Tetragnathæ* are described as new.

A memoir by Kramer on the classification of the *Acaridæ* appears in 'Archiv. f. Naturg.' (43rd year, 2nd Heft). Also, by the same author, two remarkable new genera of *Acaridæ*, *Labidophorus talpæ* and *Pygmephorus spinosus*, are described and illustrated in the 3rd Heft of the same work.

A memoir on the curious transformations which occur in various species of mites, especially in the genus *Trombidium*, with two plates, is given by M. Megnin (Ann. Sc. Nat., ser. vi., vol. iv.).

A remarkable genus of *Acaridæ* (*Heterotrichus*, belonging to the *Gamasidæ*), covered with strong bristles, is described by Donnadieu, in the 'Microscopical Journal' for June last, in which also appear a number of excellent illustrations of different *Acaridæ* by Tuffen West.

A large magnified figure of the tick found in considerable numbers in the woodwork of the roof of Blyborough Church, supposed to be parasitic on the bats, of which a good many were disturbed in repairing the roof, is given by Mr. C. F. George, in the 'Quarterly Journal' of Quekett Microsc. Club, 24th Nov. 1876, pl. 21 & 22 (and in 'Science Gossip,' 1877, p. 104). It is given as the *Argas Fischerii* of Walcken., but it seems to me identical with *A. Pipistrellæ*, Aud.

The Acarideous genera *Dermaleichus* (= *Analges*), *Freyana* and *Picobia*, are fully described, and illustrated with two fine plates, by G. Haller, in Siebold and Kölliker's 'Zeitschrift' for November last. Thirteen species of the first named genus, parasites on birds, are described with very full biological details of both sexes and their transformations. *Freyana anatina* is parasitic on

Digitized by Google

Anas boschas, and *Picobia* is an internal subcuticular parasite on birds.

A memoir, by Dr. Thorell, on Persian and Sardinian *Opilionides* in the Museum of Genoa, with a revision of the genera, appears in the 'Bericht' of the Freiburg Society of Naturalists.

An extended memoir, entitled "Phytoptocecidien," on the plant-galls formed by the singular little mites of the genus *Phytoptus*, is published in Giebel's 'Zeitschrift' (June, 1877, Series iii., Band 1), by Dr. F. Thomas.

Ptilota.

The species of insects figured by Goedartius, in his 'Historia Naturalis Insectorum,' have been subjected to careful inquiry in several recent works:—H. P. Snelleman, in the 'Album der Natuur' (1877, p. 203); Werneburg, in 'Beitrage zur Schmetterlingskunde;' Dr. Snellen van Vollenhoven, in the 'Transactions of the Dutch Entomological Society,' in which last memoir a concordance is given of all the species as determined by these different writers.

The following popular French works, forming a series of handsome 4to volumes on entomological subjects, have appeared from the house of Rothschild, of Paris:—

'Musée Entomologique Illustré,—Les Coléoptères: Organization, Mœurs, Chasse, Collections, Classification.' 48 plates and 335 woodcuts.

'Les Papillons: Organization, Mœurs, Chasse, Classification.' By Depuiset. 50 plates and 260 woodcuts.

'Les Insectes, Organization, Mœurs, Chasse, Collections, Classification,' containing the remaining orders. With 24 plates and 450 woodcuts.

'Anatomie et Physiologie de l'Abeille,' par Michael Girdwoyn. 12 lithographic plates.

Coleoptera.

Coleopterists may be congratulated on the completion of Harold and Gemminger's great 'Catalogue of Coleoptera' with the 12th volume. The number of species already described and

Digitized by Google

enumerated in this work is 77,908, the chief families (exclusive of several of the smaller groups) being as follows:—

Cicindelidæ	803
Carabidæ	8,516
Dytiscidæ	948
Gyrinidæ	147
Hydrophilidæ	573
Staphylinidæ	4,130
Pselaphidæ	450
Paussidæ	99
Scydmænidæ	269
Silphidæ	460
Histeridæ	1,151
Lucanidæ	529
Lamellicornia	6,550
Buprestidæ	2,686
Elateridæ	2,693
Malacodermidæ	2,160
Cleridæ	697
Tenebrionidæ	4,519
Cantharidæ	812
Curculionidæ	10,196
Cerambycidæ	7,568
Chrysomelidæ	10,196
Erotylidæ	1,011
Endomychidæ	366
Coccinellidæ	1,449

In the most recent general work on the invertebrated animals (Huxley's 'Manual,' p. 256), the number of all the *Arthropoda* is estimated at rather above than below 200,000, of which the larger proportion, probably more than 150,000, are insects, all the rest of the animal kingdom numbering 50,000 species. Considering, as I think we are justified in doing, that there are not fewer than 100,000 species of beetles, I should rather think the total number of insects (including Crustacea and Arachnida), cannot be fewer than a million.

Our lamented member, T. V. Wollaston, completed his labours upon the Coleopterous fauna of the Atlantic islands, a few weeks before his death, by the publication of his 'Coleoptera Sanctæ Helenæ' (8vo, 256 pages and 1 plate, Van Voorst), in which are

Digitized by Google

contained descriptions of the 203 species of beetles which he collected in the Island of St. Helena; of this number it would appear that there is every reason to suppose that fifty-seven species have been introduced into the island through various external media; seventeen other species are probable introductions (four, indeed, possessing very slight claims to having been ever found in the island); leaving one hundred and twenty-nine species as 'the veritable descendants of the Autochthones of the soil'; and of these, ninety-one are Rhynchophorous and fourteen Geodephagous; leaving only twenty-four species, distributed thus, Heteromera, six; Brachelytra, six; Priocerata, three; Phytophaga, three; Lamellicornia, two; Pseudo-trimera, two; Trichopterygia, one; and Necrophaga, one; the Hydradephaga, Philhydrida, and Longicornia being absent: whilst of the ninety-one Rhynchophora not fewer than fifty-four belong to the *Cossonidæ*, and twenty-six to the *Anthribidæ*. The presence of so many weevils and the nearly complete absence of plant beetles (Phytophaga) and Lamellicorns is very remarkable. The peculiar geographical position of the island renders the geographical distribution of its inhabitants exceedingly interesting, and we accordingly find that the author entered very fully into this question in his Introduction.

A series of articles on the Coleoptera of Japan are published in the 'Deutsche Entomol. Zeitschr.' for 1877, namely, the *Carabidæ*, by Putzeys; *Damaster*, by Kraatz; *Staphylinidæ* and *Pselaphidæ*, by Weise; *Silphidæ*, by Kraatz; *Nitidulidæ*, by Reitter; *Scotylidæ*, by Eichhoff.

The same work contains an article on the Coleoptera of Auckland Island, by Von Kiesenwetter.

Dr. Kirsch has published a memoir, entitled, 'Neue Käfer aus Malacca,' containing sixty-six species, of different families, in the 1st Heft of the 'Mittheilungen' of the Dresden Museum of Zoology (4to, 1877). He has also published the descriptions of one hundred and ten species of Coleoptera from New Guinea, including five new genera (chiefly Rhynchophorous), in the 2nd Heft of the same work.

We are indebted to Dr. J. L. Leconte for very careful lists of the Coleoptera collected, 1st, in California, and 2nd, in Southern Colorado and Northern New Mexico, with descriptions of ten new species collected by the expeditions for geographical surveys

Digitized by Google

west of the one hundredth meridian, and published as part of an Appendix (J J.) to the 'Annual Report of the Chief of the Engineers,' Washington, 1876.

A descriptive account of the *Cicindelidæ* and *Carabidæ* collected by Raffray in Abyssinia, including a number of new species, is published by Baron Chaudoir in the Rev. and Mag. Zool. 1876, (pts. 10 and 11.)

"Notes on the *Cicindelidæ* of the United States," by Dr. J. L. Leconte, published in the Trans. Amer. Entom. Soc. (v. 5), contains the description of a new species of *Omus*, six new species of *Cicindela*, with figures of the elytra of several species, including *C. Magdalenæ*, so named by Dr. Leconte in commemoration of his visit to Magdalen College, Oxford, the only known specimen of which species is in the Hope Collection in the Oxford Museum.

"Notes on the *Rhysodidæ* of the United States," by Dr. J. L. Leconte, also published in the Trans. Amer. Ent. Soc. (vol. v.), contains descriptions of two species of the singular genus *Rhysodes* (one new), three species of *Clinidium*, Klug. (one new). These descriptions are followed by an inquiry into the relations of the *Rhysodidæ*, which are considered as most intimately allied to the *Cupesidæ*, and as "quite distinct from any existing types, and as the 'remains' of a series of Coleoptera existing in former times which was of an undifferentiated nature, and was the original stem, or contained the ancestry, if I may use the realistic expression of a modern school, of the several series which are comprised in the now existing great complex of normal Coleoptera with the penultimate joint of the tarsi not anchylosed to the last joint, consisting of the series *Adephaga*, *Clavicornia*, *Lamellicornia* and *Serricornia*."

"Description of New Coleoptera of the United States: with Notes on Geographical Distribution," by Dr. J. L. Leconte, appears in the 'Trans. Amer. Ent. Soc.' (vol. 5). Twenty-five new species of different families are here described.

A very careful investigation of the whole of the structure and character of the genus *Hypocephalus*, one of the most anomalous of known beetles, by Dr. J. L. Leconte, has been published in the Transactions of the American Entomological Society (vol. v.), followed by a comparison with the characters of other Coleopterous groups, with which it has been assumed to be

Digitized by Google

related, which has led Dr. Leconte to adopt the opinion advanced by Spinola that the insect must be excluded from all other families of Coleoptera, but that, as first suggested by myself, it belongs to a series connecting *Passandra*, *Catogenus* and *Rhysodes* with *Calodromus* and the *Brenthidæ*, a suggestion which I subsequently modified in deference to the authority of Burmeister and others. Dr. Leconte goes further than this, maintaining that it is "still more isolated, and represents a fragment of a very old fauna, of which, as I have already endeavoured to show, *Trictenotoma*, *Cupes*, and *Rhysodes* * are remnants, to which, also, the *Brenthidæ*, though numerous, and perhaps greatly modified in recent geological times, might be added."—*Op. cit.*, p. 216.

A memoir on the family *Pselaphidæ* is given by Schaufuss, in his "Nunquam Otiosus" (ii. p. 450), in which several new genera and species are described.

A monograph of the Australian species of *Lycidæ* is given in the Trans. Ent. Soc., London, June, 1877, by Mr. C. O. Waterhouse, containing thirty-eight species, of which twenty-four are described as new. The same author has also published monographs of the genera *Calochromus* and *Callirrhipis*, consisting for the most part of Malayan species, in the 'Cistula Entomologica' (part xvii.) and Trans. Ent. Soc.

Dr. Sharp has published descriptions of New Zealand *Elateridæ* in Ann. Nat. Hist., May and June last; and of other New Zealand beetles in the Ent. Mo. Mag.

A memoir, also by Dr. Sharp, containing "Descriptions of some New Forms of Aberrant *Melolonthini* from Australia, forming a Distinct Sub-Tribe (*Systellopides*) allied to *Pachypus*" is published in Annali del Mus. Civic. di Sci. Nat. di Genova (vol. ix.) March, 1877; and the same work also contains the description of a new genus of *Dynastidæ* from New Guinea, by the same writer.

Descriptions of six new and beautiful species of exotic *Cetoniidæ* are published by Mr. Oliver Janson in the 'Cistula Entomologica' (vol. ii. part 16.)

M. Lichtenstein has communicated to the Academie des Sciences of Paris the successful result of his investigation of the various larval states of the common blister beetle (*Cantharis vesicatoria*), which agree in the main with the details which have been

* Leconte, "Notes on the *Rhysodidæ* of the United States," Tr. Am. Ent. Soc., 1875, p. 162, *seq.*

Digitized by Google

published of the other *Vesicantia*. 'Comptes Rendus,' Oct. 1, 1877 (p. 628), and Ann. Nat. Hist. (5 Ser., vol. i., p. 104.)

In the Transactions of the Saint Louis Academy of Science November 5, 1877, Prof. C. V. Riley has published an admirable memoir "On the Larval Characters and Habits of the Blister Beetles belonging to the Genera *Macrobasis*, Lec., and *Epicauta*, Fabr.: with Remarks on other Species of the Family Meloidæ," of which an abstract has been published in the Ent. Monthly Mag., but without the excellent figures with which the original memoir is illustrated. Unlike the allied European genera, the young larvæ of the *Epicautæ* are found of different ages within the egg-pods and devouring the eggs of a locust, *Caloptenus spretus*. These larvæ, however, like their European relatives, go through several hypermetamorphoses, differing, however, in many important respects from *Meloë* and *Sitaris*.

This paper is followed by another by the same author, "On a Remarkable New Genus in *Meloidæ* infesting Mason-Bee Cells in the United States." This new genus and species, named *Hornia minutipennis*, has the appearance of a small *Meloë*, but with minute divaricating elytra and quite simple tarsal claws. These two memoirs constitute one of the most important contributions which have recently been made towards the biology of the Coleoptera.

Mr. Pascoe has published the descriptions of a considerable number of species of Coleoptera from New Zealand, chiefly *Curculionidæ* (Annals Nat. Hist., February, 1877.)

We are indebted to Drs. John L. Leconte and George H. Horn (*par nobile fratrum*) for an 8vo volume of 470 pp. (published as the fifteenth volume of the 'Proceedings of the Americal Philosophical Society,' held at Philadelphia, for the Promotion of Useful Knowledge), upon the *Rhynchophora* of America, north of Mexico. The numerous* species of weevils inhabiting North America are divided into three primary groups:—

1. Haplogastra. Abdomen alike in both sexes; pygidium small; elytra without lateral fold on the inner surface. Fam. *Rhinomacerida*, *Rhynchitidæ* and *Attelabidæ*.

2. Allogastra. Abdomen dissimilar in the two sexes, those of the males with an additional anal segment; pygidium large; elytra with an acute lateral fold on the inner surface. Fam. *Brysopidæ*, *Otiorhynchidæ*, *Curculionidæ* and *Brenthidæ*.

* Unfortunately the enumeration of the species is irregular in the text.

Digitized by Google

3. HETEROGASTRA. Abdomen alike in both sexes; elytra with a distinct lateral fold on the inner surface. Fam. *Calandridæ, Anthribidæ, Scolytidæ* and *Apionidæ.**

These insects are regarded by Dr. Leconte as "the lowest type of Coleoptera, and therefore geologically the oldest. Regarding, then, the fixity of insect types as shown by the resemblance of ancient forms to those of the present time, the uniformity in food and manner of life, and the immense number of genera in this complex, we have a right to expect that there will be a proportionally larger survival of unchanged descendants of those species or genera which were first introduced. We will therefore have a more perfect series of connecting forms than can be found in other orders of insects, whose methods of life expose them to the influences of destruction or modification by external circumstances." A remarkale Appendix is given, drawn up with much labour by Mr. B. P. Mann, of Cambridge, Mass., of the bibliography of memoirs relating to the Economic Entomology of the *Rhynchophora* of the United States, relating to the benefits, habits, proposed remedies against, descriptions, injuries, seasons, food, localities and transformations, derived from the 'American Entomologist,' the 'Practical Entomologist,' 'New England Farmer,' 'Packard's Guide,' Harris's 'Insects injurious to Vegetation,' Fitch's 'Reports on Insects of New York,' 'Transactions of New York State Agricultural Society,' Riley's 'Reports,' Walsh's 'Report on Insects of Illinois,' and 'Canadian Entomologist,' and in 'Psyche,' published in monthly numbers by the Cambridge Entomological Club, Cambridge, Mass.

A remarkable tabular synopsis of the *Rhynchophora* and their geographical distribution in the different zoological provinces of temperate North America, has also been published by Drs. J. L. Leconte and G. H. Horn, in the 'Proceedings' of the Amer. Phil. Soc., vol. xvi., No. 96, in which are tabulated the numbers of already described and new species; also of the geographical distribution of the genera, whether Atlantic, Central or Pacific, and a similar table of the geographical distribution of the species. The total number of the genera is 270, and that of the species is 922. The instances in which similar extraordinary forms occur

* This classification is opposed by M. Roelofs, 'Compte-Rendre Soc. Ent. Belg.,' 26 December, 1877.

Digitized by Google

in geographical regions very remote from each other corresponded with what Dr. Leconte had previously shown in the other higher types of Coleoptera, and he again expressed the opinion that the isolated and feebly represented, though sometimes widely distributed forms in insects, were representative survivals of the faunæ of former geological periods.

A supplement to the list of Dutch Coleoptera, by Dr. J. E. Everts, with an especial list of the *Halticidæ*, carefully worked out by A. F. Leesberg, is given in the 4th part of the 20th volume of the 'Transactions' of the Dutch Entomological Society. The total number of species recorded is 2397.

Mr. Baly has, with unwearied industry, continued his descriptions of the interminable species of Phytophagous Beetles. The 'Journal of Proceedings of the Linnean Society,' vol. xiii., contains descriptions of thirty new Australian species, four of which constitute new genera belonging to the families *Chrysomelidæ* and *Halticinæ*.

A monograph of the Phytophagous genus *Eumolpus*, together with descriptions of new species belonging to that family, is published by Mr. Baly, in Trans. Ent. Soc., 1877, as well as a paper containg descriptions of new exotic genera and species of Cryptocephalides. Papers, by the same writer, on exotic species of Phytophagous beetles, of various families and of various countries, appear in Ann. Nat. Hist. (Ser. 3, vol. i.); and in the seventeenth part of the 'Cistula Entomologica,' Mr. Baly has published descriptions of a number of new species of exotic *Phytophaga*, without any indications of the families to which they belong. This desultory and ubiquitous mode of publication is most inconvenient to the student of the great tribe to which Mr. Baly devotes his labours.

Orthoptera.

Dr. C. Stål has published a considerable addition to our knowledge of South African Orthoptera, collected in Damaraland and Ovampo, in his "Bidrag till södra Afrikas Orthopter fauna," in the 'Kongl. Vet. Akad. forhandl.' (1876): the greater number of new species, with various new genera, belong to the *Acridiodea* and *Locustina*. A list is also given of twenty-one species from Cape Land, including one new species, *Maxentius fusco-fasciatus*.

Digitized by Google

The same author has also published the following Orthopterological memoirs, presented to the Royal Academy of Stockholm, Band 4, No. 5:—

1. "Les Genres des *Acridiodées* de la Faune Européenne."
2. "Aperçu des Genres des *Acridiodées* de l'Amerique du Nord."
3. "Sur *Anostostoma* et quelques Genres voisins."
4. "Diagnoses d'Orthoptères nouveaux."

A list of the Orthoptera of Illinois, containing forty-six species, of which two are new, by Cyrus Thomas, is published in the 'Bulletin' of the Museum of Illinois.

We have to welcome the appearance of the first part of the 'Annales de la Sociedad Espanola de Historia Natural,' containing a synopsis of the Orthoptera of Spain and Portugal, by M. Bolivar.

A memoir by Mr. Samuel H. Scudder, upon the Orthopterous insects collected by the United States Expedition for Geographical Surveys West of the 100th Meridian during the field season of 1875, has appeared as an appendix, "J.J.," to the 'Annual Report of the Chief of the Engineers' (Washington). The fifty species here described were collected chiefly in New Mexico and in the eastern slopes of the Rocky Mountains, and of this number nearly one half proved new to science. Three crickets, nine long-horned grasshoppers, and thirty-six locusts (*Acridii*), are described and careful tabulations of the species of *Pezotettix*, and of the sixteen genera of *Œdipodidæ*, of which several are new are added.

We are indebted to Mr. S. H. Scudder for a valuable tabulation of the primary groups of Orthoptera, with references to all the works in which American species of the order have been published ('Psyche,' vol. i., No. 26).

We are further indebted to Mr. Scudder for a memoir on the mode in which the wings of the *Blattidæ* and earwigs are folded and unfolded, being a supplement to the memoirs of M. H. de Saussure on this subject ('American Naturalist,' Sept. 1876).

Careful descriptions of the thirty-eight species of earwigs known to be natives of North America and the West Indies are given by Mr. Scudder, in the 'Bulletin of the Geological and Geographical Survey of the U.S. Territories,' vol. ii., No. 3 (Washington), together with some short notes on the fossil species of the group hitherto observed in North America.

Digitized by Google

The same work also contains a list of the Orthoptera collected by Dr. A. S. Packard in Colorado and the neighbouring territories during the summer of 1875, consisting of twenty-nine species, of which seven are new. Four new genera are also indicated.

Descriptions of twenty-three new species of *Forficulidæ* are given by Mr. S. H. Scudder, in the Proc. Boston Soc. Nat. Hist. (vol. xviii.). The same author has also published in this volume a series of critical and historical notes on the *Forficulariæ*, including descriptions of new generic forms and an alphabetical synonymical list of the described genera, and another alphabetical list of the described species, with occasional brief notes; the species not being arranged in a single alphabetical series with a reference to their respective genera, but the species belonging to each genus are placed alphabetically under each genus.

'Mélanges Orthoptérologiques,' fasc. V., Gryllides, by M. H. de Saussure, form part of the memoirs of the Société de Physique et d'Hist. Nat. de Genéve (tom. xxv., 1877). The present part of this valuable work is devoted to the family of the crickets, to which the name of *Gryllidæ* is applied, and which are divided into six tribes:—1. *Gryllotalpii*, including the Tridactylites; 2. *Myrmecophilii*; 3. *Gryllii*; 4. *Œcanthii*; 5. *Trigonidii* and *Eniopterii*. The genera and species are described with the accustomed skill of the author, and the plates are overflowing with generic details of these little studied but very curious insects.

Descriptions of twenty-one new species of Orthoptera belonging to the family of the Locusts (*Acriidiodea*, Burm.) from Senegal, including several new genera, are described by Krauss, in the Proceedings of the Imp. Acad. Sci., Vienna, 21 June, 1877.

In his 'Systema Mantodeorum, Essai d'une systematisation nouvelle des Mantodées' (Stockholm, 1877, 8vo, ninety-one pages and one plate), Dr. Stål has introduced a new element in the primary distribution of the genera of *Mantidæ* (which he divides into six subfamilies, *Amorphoscelidæ*, *Eremophilidæ*, *Mantidæ*, *Vatidæ*, *Harpagidæ* and *Empusidæ*), founded chiefly upon denticulation of the anterior tibiæ and veining of the wings. A great number of new genera and species, especially from the collection of M. Brunner de Wattenwyl, are described in this memoir.

Descriptions of two new genera of *Mantidæ* from India, and a note on the femoral brushes of the *Mantidæ*, by Mr. Wood-Mason,

Digitized by Google

appear in the Annals Nat. Hist., of March last, and descriptions of new species of *Phasmidæ* in the 'Annals' for June; also descriptions of *Phasmidæ* and *Mantidæ* from Australia and New Britain in the 'Annals' for July.

Several new species of *Phasmidæ* are described and excellently figured by Mr. Wood-Mason in the 'Journal of the Asiatic Society of Bengal,' vol. xlvi., 1877.

Neuroptera.

Dr. Hagen has published a 4to report on the collections of Neuroptera and Pseudo-Neuroptera made in portions of Colorado, New Mexico, and Arizona. A large portion of the collection was unfortunately destroyed by a railroad accident, so that only four new species of different families are here described.

Dr. Hagen has described a new genus and species, *Symphrasis signata*, from California, belonging to the curious group of *Mantispides*, to which new genus my *M. myrapetrella* is also associated (Stettin Ent. Zeitung).

A memoir on the habits of *Embia* (a genus allied to the white ants), by Mr. M'Lachlan, with an account of its nymph state, and a description of four new species, one of which was found in a hothouse, in London, among plants of *Saccolobium retusum*, imported from India, is published in the 'Proceedings of the Linnean Society.'

An article by Dr. C. von Siebold, on the curious genus *Helicopsyche*, one of the caddice-flies, the larvæ of which construct cases which had been mistaken for shells, and had been so-called, appears in the 'Bolletino' of the Italian Entomological Society (vol. viii.).

Hymenoptera.

Mr. P. Cameron has published a very serviceable series of notes on the modes of collecting and studying the habits of the various species of plant-feeding Hymenoptera (*Tenthredinidæ* and *Cynipidæ*), both in the perfect and preparatory states, and has added a list of their food-plants, indicating those which are infested by gall-makers or leaf-miners (Proc. Nat. Hist. Soc. Glasgow, January, 1877).

The same author has given descriptions of new genera and species of Indian *Tenthredinidæ* in the East Indian and British

Digitized by Google

Museums, including two new genera, *Siobla* and *Ancyloneura*, published in the 'Transactions' of the Entomological Society of London for 1877.

Mr. Cameron has also published his notes on the seven Old-World species of *Athalia* (including the destructive "nigger," or "black-jack," of the turnip), in the same work, for January, 1877.

A monograph of the British species of the Tenthredinideous genera *Phœnusa* (seven species) and *Cladius* (seven species), in which the larvæ of nearly all the species, as well as the perfect insects, and their food-plants and habits, are carefully described, is published by Mr. P. Cameron, in the 'Proceedings of the Natural History Society of Glasgow.'

A series of notes, with localities and habits of various species of *Tenthredinidæ* and *Cynipidæ* found in the Clydesdale district, are given by Mr. P. Cameron, in the 'Proceedings of the Natural Hist. Soc. of Glasgow,' April, 1874, including very careful descriptions of the larvæ of four species of *Trichiosoma*, which had been hitherto confused, namely, *T. lucorum*, L., on birch; *Sorbi*, Hartig, on *Pyrus aucuparia*; *Vitellinæ*, on willows; and *Betuleti*, Kl. (*Cratægi*, Zadd.), on the hawthorn.

A series of short articles, consisting of translations from Dr. Mayr's work on the galls of the oaks of Central Europe, with woodcut copies of his figures, has for some time past been in course of publication in the pages of the 'Entomologist.'

The structure of the ovipositor of the females of the *Cynipidæ*, illustrated by *Aphilothrix Radicis*, with highly magnified figures, is given by Dr. M. W. Beijerinck, in the fourth part of the twentieth volume of the 'Transactions of the Entom. Society of the Netherlands.'

The fourth and fifth parts of Dr. Snellen van Vollenhoven's laborious work on the North-west European Ichneumonidæ (*Sensu Linn.*) have been published during the past year, including the genera *Metopius*, *Exetastes*, *Codrus*, *Proctotrupes*, *Colpomeria*, *Lycorina*, *Pimpla*, *Tryphon*, *Mesoleius*, *Iphiaulax*, *Bracon*, *Oxylabis*, *Belyta*, and *Ismarus*.

'Hymenoptera Scandinaviæ,' auctore C. G. Thomson (tom. iv., pp. 193 to 258); this part, concluding the fourth volume of the work, is devoted to a portion of the great sub-family *Pteromalides*, belonging to the family *Chalcididæ*.

Digitized by Google

In the 'Entomologist' for March, 1877, Mr. F. Smith has given a summary of the new and rare species of Aculeate Hymenoptera, taken in this country since the termination of the 'Entomologist's Annual,' in 1873.

A memoir, in the Russian language, upon the species of *Ants* collected in Turkestan by H. Fedtschenko, extending to twenty pages, 4to, has been published by Dr. Gustav Mayr, as portion of the travels of that voyager. Fortunately the specific characters of the new species are given in Latin.

The Smithsonian Institution of Washington has published an 8vo volume, of about 480 pages, by Dr. H. de Saussure, containing a complete monograph of the solitary species of wasps of America, north of the Isthmus of Panama, likewise of the Antilles and Mexico; including the catalogue of all the species hitherto known in the rest of America. The descriptive portion of the work is preceded by an excellent introduction, of which the only passage that appears to me objectionable is one in which the author recommends that specimens should not be carefully set whilst fresh; the consequence of this practice would be that the veining of the wings would not be seen, owing to those organs being folded, and in many cases the peculiar structure of the legs would not be at once visible. The number of species described or mentioned are—*Trimeria*, one (S. Am.); *Masaris*, three; *Gayella*, one (Chili); *Zethus*, sixty; *Labus*, one (Chili); *Discœlius*, two; *Eumenes*, fifty-three; *Montezumia*, twenty-four; *Monobia*, eleven; *Nortonia*, three; *Odynerus*, one hundred and fifty-nine; *Leptochilus*, two; *Pterochilus*, four; *Ctenochilus*, one (Chili); *Alastor*, five; *Smithia*, one (Africa); with seven uncertain species: total, three hundred and thirty-eight.

Lepidoptera.

The trustees of the British Museum have at length issued a 4to volume of excellent coloured plates of *Sphingidæ* and nocturnal Lepidoptera, executed many years ago by Mr. W. Wood, jun., with additions and with text by Mr. A. G. Butler.

The first part of the 'Mittheilungen' of the Zoological Museum of Dresden contains a memoir, by Kirsch, on the Lepidoptera of New Guinea (one hundred and sixty-seven species, of which only one hundred and thirty-three are Diurna).

Digitized by Google

'Etudes d'Entomologie, Première livraison, Faune des Lépidoptères d'Algerie: Deuxième livraison, Nouveaux Lépidoptères de la Chine.' By Charles Oberthur (Rennes, 1876). Under this title M. Oberthur, the purchaser of the famous lepidopterous collection of M. Boisduval, has brought out the first two parts of a splendid work, in small folio, with charming coloured plates, containing descriptions and figures of new species of lepidopterous insects from Algeria and China; amongst the latter the famous *Armandia Thaitina* is represented.

The second series of the continuation of Sepp's 'Nederlandische Insecten' has been continued, by Dr. S. C. Snellen van Vollenhoven, by the publication of excellent coloured plates, and descriptions of the following species of moths and their transformations:—*Harpella bractella, Ino Pruni, Paraponyx stratiotata, Solenobia triquetrella, Ephestia interpunctella, Coleophora solitariella, Pempelia Betulæ, Metrocampa margaritaria, Grapholitha Wœberana, Lioptilus tephradactylus, Adela DeGeerella,* and *Eugonia fuscantaria.*

The lepidopterous fauna of the Andaman and Nicobar Islands forms the subject of a memoir by Mr. F. Moore, published in the Proceedings of the Zool. Soc. of London, June 19, 1877. Two hundred and seventy-four species (including one hundred and four Diurna) are introduced into this memoir, of which a considerable number are new. Three coloured plates, and an excellent geographical tabulation of the species, complete the technical descriptions and lists.

Twenty-seven new species of Oriental butterflies of different families are described by Mr. F. Moore, in the Annals of Nat. Hist., July, 1877; and a number of new species of heterocerous Lepidoptera of the tribe Bombyces, collected by Mr. W. B. Pryer, chiefly in the district of Shangai, are also described by Mr. Moore, in the Annals Nat. Hist., Aug. 1877; and the same author has also published the descriptions of twenty-five species of Lepidoptera of different groups, including nine Diurna (Ann. Nat. Hist., Oct. 1877).

Mr. W. F. Kirby has published the Supplement to his Synonymic Catalogue of Diurnal Lepidoptera, from March, 1871, to June, 1877 (8vo; London, Van Voorst; 200 pages).

The Transactions of the Natural History Society of Northumberland and Durham (vol. v., pt. 3) contain papers on the Lepidoptera of those counties, by W. Maling and J. C. Wassermann.

Digitized by Google

A remarkable paper, entitled, "Notes on some of the Genera [of butterflies] of Mr. Scudder's Systematic Revision," by Mr. T. L. Mead, appears in the 'Canadian Naturalist.' These notes are founded on a minute measurement of the lengths of various organs which have been employed for generic characters, such as the place of origin of the different branches of the veins of the wings, the discoidal cell, length of antennæ, the joints of the palpi and joints of the legs, &c., these measurements having been made by means of a micrometer eye-piece to the thousandth of an inch, the results proving that the venation of the wing is very variable in specimens of the same species, and that no generic distinction whatever can be based on slight differences in the proportionate length of the cell and wing, or the origin of the first and second branches of the subcostal nervures of the primaries.

A catalogue of the 506 species of Diurnal Lepidoptera of America north of Mexico is published by Mr. W. H. Edwards in the Trans. American Entom. Soc., 1877. In this catalogue the author rejects both the classificational and evolutional views of Messrs. Bates, Scudder, &c., as well as many of the changes in the nomenclature proposed by Mr. Scudder. His work, therefore, "adheres mainly to the order of Doubleday and his associates in the 'Genera of Diurnal Lepidoptera.'" Rejecting, also, the special classification of the *Hesperidæ* proposed by Mr. Scudder "which was at once found objectionable on account of the excessive restriction of the groups called genera," he has given by way of supplement a generic classification of them, written by Dr. Otto Speyer, in which eleven genera only (in lieu of Mr. Scudder's thirty-nine) are adopted.

A notice of a small collection (fourteen species) of butterflies from Cape Breton Island is given by Mr. S. H. Scudder in the Proceedings of the Boston Soc. of Nat. Hist. (vol. xviii.), noticeable chiefly on account of the dimorphic and gynandromorphic character of the females of *Eurymus Philodice*, of thirty-nine specimens of which ten were gynandromorphic females and eight pallid (dimorphic) females.

A notice of a collection of thirty-three species of butterflies collected in Colorado and Utah, by Dr. A. S. Packard (all of which had been previously described), has been published by Mr. S. H. Scudder in the 'Bulletin of the Geological and Geographical Survey of the United States Territories' (vol. ii.)

Digitized by Google

A memoir of Messrs. Godman and Salvin on butterflies from Central America, containing twelve new species and one new genus (*Bolboneura*, type *Temenis sylphis*, Bates), appears in the Proceedings of Zool. Soc., 1877 (part i.)

A tabulation of the difficult species of the genus of butterflies, *Parnassius*, is given by Schaufuss ('Nunquam Otiosus,' ii., p. 419).

The description of the preparatory states of *Argynnis nyrina*, with very precise notes of the times of moulting, is given by Mr. W. H. Edwards in the 'Canadian Entomologist' for September, 1876; and the same writer has also described the preparatory states of *Lycæna comyntas* in the same work.

Mr. Hewitson has published another part of his beautiful work on the *Lycænidæ* in the course of the last year.

In 'Equatorial Lepidoptera' (part v.), Mr. Hewitson has also described thirty new species of butterflies of different families collected by Mr. Buckley in Bolivia.

Descriptions of numerous new species of *Hesperidæ* from various countries are published by Mr. Hewitson in Annals Nat. Hist., December, 1876, January, 1877, and October, 1877.

The 16th and 17th parts of the 'Cistula Entomologica' contain papers on species of *Danaidæ* and *Heliconidæ*, by Mr. A. G. Butler; on new species of butterflies from the Japanese Island of Niphon, by Mr. Oliver Janson; also a paper on a Lepidopterous genus, *Cryptolechia* (of which the family is not given), with twenty-six species, by Mr. A. G. Butler, together with the description of a new Abyssinian *Attacus*, by the last-named author.

The genus of butterflies *Euptychia*, belonging to the family *Satyridæ*, has formed the subject of a memoir by Mr. A. G. Butler, published in the 'Proceedings of the Linnæan Society' (vol. xiii., pl. 12.) One hundred and seventy-nine species are recorded, the author having added sixty new species in 1866, and ten more in 1867, and thirteen additional are here described. The species, which are entirely natives of South and Central America, are here arranged in a number of groups, each named after a typical species, without divisional characters.

Nine new species of butterflies and moths of different families, in the collection of the British Museum, from Lake Nyassa and Queensland, are also described by Mr. Butler, in the Annals Nat. Hist., June, 1877.

Digitized by Google

A monograph on the genus *Castnia* and some allied lepidopterous groups, by myself, is published in the 'Transactions of the Linnean Society' (2nd ser. Zool., vol. i.), with five plates. Sixty-eight species of *Castnia*, one of *Orthia*, seventeen of *Synemon*, one of *Tascina* (n. g. from Singapore), and three of *Hecatesia*, are described, with a supplement containing seven species of *Othria* (n. g.), four of *Damias*, one of *Burgena*, one of *Hespagarista*, five of *Rothia* (n. g.), one of *Ægiale*, and one of *Megathymus*.

Mr. A. G. Butler's elaborate revision of the Heterocerous Lepidoptera of the family *Sphingidæ* has been published in the ninth volume of the 'Transactions of the Zoological Society.' The species, 579 in number, are divided into eighty-five genera and six sub-families. The memoir is illustrated with five excellent plates of larvæ and perfect moths.

Mr. W. F. Kirby has published a series of notes on African *Saturniidæ* in the collection of the Royal Dublin Society, in Trans. Ent. Soc., 1877, including four new species, one of which, *Eudæmonia argiphontes*, is a remarkable insect closely allied to but larger than *Bombyx brachyura*, Drury (*argus*, Stoll.)

A memoir on the numerous species of the genus *Catocala* found in North America appears in the 'Canadian Naturalist.'

The Malayan moths of the genus *Cleis* (*Damias* p., Boisduval), including ten species, are catalogued and described by Mr. Butler in the 'Annals Nat. Hist.', May, 1877; as well as "Descriptions of new Species of Lepidoptera-Heterocera from Japan," Part ii., *Noctuites*. Twenty-one species of *Noctuidæ* are here described.

Hemiptera.

The third part of the twentieth volume of the 'Transactions' of the Entomological Society of the Netherlands is occupied with the continuation of the 'Proceedings' (Verslag) of the Society; and contains also the memoir of Dr. Snellen van Vollenhoven on the Heteropterous Hemiptera of Holland, which is continued and terminated in the fourth part of the same 'Transactions,' the whole having been subsequently published in a handsome volume entitled 'Hemiptera Heteroptera Neerlandica; de inlandsche land en Waterwantsen.'

M. Signoret has completed his excellent work on the *Coccidæ*, which has appeared from time to time in the 'Annales' of the French Entomological Society since 1868, by the publication of a

Digitized by Google

Supplement, with notices of fifty-eight species of uncertain genera, and by an excellent index of the plates and a systematic catalogue and full alphabetical indices of all the genera and species described in the various divisions of his memoir.

Diptera.

The Baron C. R. Osten-Sacken has enriched Dipterology with a valuable contribution to the 'Bulletin of the Geological and Geographical Survey of the United States' (vol. iii. No. 2, Washington, April, 1877, pp. 165), containing descriptions of the Diptera of the Region of North America west of the Mississippi, and especially from California, collected by the author himself. These countries seem especially rich in *Bombyliidæ* and *Asilidæ*, and notes on the general geographical distribution of these and other groups are given in the course of the work, to which is also added an Appendix, containing a more general notice of the geographical distribution of the Diptera. A great number of new species are described, not more than fifty having been previously published.

A fine volume entitled 'Diptera Neerlandica,' illustrated with fourteen plates, has been published by Van der Wulp (large 8vo, 1877).

Microcephalus is the generic name (already preoccupied in Entomology) given by Schnabl to a new Œstrideous insect from Western Siberia, allied to *Hypoderma*, a description of which is published in the 'Deutsche Entomol. Zeitsch.' for 1877. Nothing is recorded of the habits of the insect.

Myzostomata.

The limits of the great division of the Articulata are gradually extending, in consequence of the minute attention bestowed on various hitherto obscure groups. In addition to the *Tardigrada*, *Pentastomata*, *Linguatulina*, and *Peripatus* (so excellently worked out by Mr. Moseley, zoologist of the 'Challenger' Expedition), we must now include the Myzostomata, which have been elaborated by Dr. L. Graff, in a fine folio monograph, with eleven plates, entitled "Das genus *Myzostoma*." These are small animals parasitic upon *Comatula* and other Mediterranean *Crinoidea*, with oval or circular slightly convex bodies, with lateral appendages of varied form, and five pairs of very short-jointed legs, each terminated by a single retractive claw. The mouth is a porrected fleshy

Digitized by Google

tubular proboscis surrounded by eight small fleshy lobes. The whole animal resembles a small female Bopyrian, or the female of the cochineal insect. They are most nearly allied to the *Tardigrades* and *Linguatulæ*.

P.S.—I accidentally omitted to mention, in the section of this Address devoted to Economic Entomology, a Report entitled 'Notes of Observations of Injurious Insects' noticed during the year 1877. The name of E. A. Ormerod is appended as the reporter, who appears to have been assisted by the Rev. T. A. Preston, one of the indefatigable Masters of Marlborough College, and E. A. Fitch, of Maldon, Essex. Notes on the times of appearance and injuries committed by sixteen destructive species of insects are given (unaccompanied by descriptions of the insects themselves, the place of which is supplied, for the most part, by copies of the woodcuts executed from the drawings of Mr. Curtis and myself for the 'Gardeners' Chronicle' many years ago—a fact which ought to have been mentioned). It is proposed to publish these Reports annually, and contributions of observations from agriculturists or entomologists are requested by the Editors, who have printed this first Report for distribution amongst the observers; but which is also procurable gratuitously, together with sheets for record of observations, on application to the printer, Mr. Newman.

Digitized by Google

Digitized by Google

Abstract of Treasurer's Account for 1877.

Receipts.	£	s.	d.	Payments.	£	s.	d.
Balance in hand from last Account	6	8	0	Rent, Librarian and Office Expenses, Teas, &c.	115	2	7
Arrears of Subscriptions received in 1877	25	4	0	Printing 'Transactions' and 'Proceedings'	152	18	10
Subscriptions for 1877	161	14	0	Plates, Drawing, Engraving and Printing	34	17	9
Admission Fees	8	8	0	Do., Colouring	20	0	0
Donations	26	12	6	Binding and Purchase of Books	13	13	6
Sale of Publications	109	8	1	Balance in the hands of Treasurer	9	18	1
Dividend on £297 9*s.* 9*d.* Consols	8	16	2				
	£346	10	9		£346	10	9

Audited and found correct, *January* 12, 1878.
SIDNEY SMITH SAUNDERS.
W. L. DISTANT.
J. W. DUNNING.

Assets of the Society.

	£	s.	d.
Arrears of Subscriptions considered good (say)	21	0	0
Cost of £297 9*s.* 9*d.* 3 ℘ Cent. Consols	277	9	0
Cash Balance in hand	9	18	1
	£308	7	1

J. JENNER WEIR, *Treasurer.*

January 12, 1878.

Digitized by Google

Digitized by Google

INDEX.

NOTE.—Where the name only of an Insect is mentioned, the description of the Insect will be found at the page referred to.

The Arabic Figures refer to the pages of the 'Transactions;' the Roman Numerals to the pages of the 'Proceedings.'

	PAGE		PAGE
GENERAL SUBJECTS....	lxxxv	HYMENOPTERA	xc
ARACHNIDA	lxxxv	LEPIDOPTERA.....	xc
COLEOPTERA	lxxxvi	NEUROPTERA	xciii
CRUSTACEA.....	lxxxix	ORTHOPTERA	xciii
DIPTERA	lxxxix	STREPSIPTERA	xciii
HEMIPTERA	lxxxix		

GENERAL SUBJECTS.

Annual Meeting, xxxv.
Channel Islands Institute of Pisciculture, xxix.
Cocoa-nut trees in Barbadoes destroyed by *Coccus*, xx.
Entomological station at Basle, xxiii.
Floral simulation by insects, xxix.
Micro-photographs enlarged, showing parts of insects, xxxii.
Nest from Jamaica, supposed to belong to an insect, x.
President's Address, xxxvii.
'Pruritus' caused by *Trombidium*, ii.
Season-dimorphism, remarks on, vi.
Stridulating organs in a spider, 281 and xviii.—in scorpions, xviii.—in a Crustacean, xxvii.—in *Phasmidæ*, xxviii.—in the *Œdipoda*, xxix. Experiment illustrating the sound produced, xxxii.—in pupa of *Thecla rubi*, xxxiii.—in *Curculionidæ*, xxxiii.

ARACHNIDA.

Atypus Sulzeri, from Hampstead, viii.—Remarks thereon by Mr. Enock, xv.—Remarks on specific identity, xxx.
Chelifer, a large species from Spain, viii.

Digitized by Google

ARACHNIDA—*continued.*

Mygale stridulans, note on, 281.—Drawing exhibited, xviii.
Scorpions possessing stridulating organs, xviii.—structure of organs, xxxiii.
Silken cocoon from Cape of Good Hope, viii.
Spider's nest from Montserrat, viii.
Trombidium, 'pruritus' caused by a species, ii.

COLEOPTERA.

Acolastus Simonsi, 229.
Adelotopus collaris, 2.—*marginatus*, 2.
Alaus nodulosus, 4.—*Parreyssi*, from Thaso Island, viii.
Aphodius scrofa, taken in Britain, iv.
Aphthona amazona, 299.—*chinensis*, 295.—*crassicornis*, 295.—*Deyrollei*, 296.—*diversa*, 297.—*fulvipes*, 298.—*nigro-cyanea*, 298. *Pilatei*, 296.—*verticalis*, 297.—*Wallacei*, 178.
Aporocera, Saund., 28.
Apræa, 293.—*A. Jansoni*, 294.
Argopus Fortunei, 181.
Arsipoda cæruleata, 159.—*fulvipes*, 284.—*hæmatodera*, 158.—*mærens*, 285.—*Wallacei*, 285.
Bembidium nigricorne, from Chobham, vi.
Brachycaulus, Fairm., 26.
Bradycnemis, 11.—*B. anomala*, 12.—*velutina*, 12.
Cadmus, Erichs., 26.
Callidium violaceum, habits of, 279.
Callirrhipis antiqua, 384.—*Bowringii*, 383.—*costata*, 388.—*cribrata*, 390.—*cyanicollis*, 391.—*dissimilis*, 380.—*fasciata*, 381.—*femorata*, 386.—*gausapata*, 388.—*inconspicua*, 392.—*læta*, 386.—*Laportei*, var., 393.—*lineata*, 387.—*longicornis*, 385.—*residua*, 389.—*reticulata*, 391.—*robusta*, 385.—*simplex*, 392.—*stabilis*, 383.—*suturalis*, 389.—*trepida*, 382.
Carabus monilis and *violaceus*, habits of, 279.
Cardiophorus rufipes, captured at Paisley, iv.
Catascopus cupreicollis, 1.
Cerambyx heros, imported alive from Bosnia, xiii.
Ceratorrhina Grandyi, 202.—*Hornimanni*, 202.—*Morgani* exhibited, ix.—*quadrimaculata*, Fab., 201.—*quadrimaculata* exhibited, ix.
Cetonia aurata, habits of, 277.
Chætocnema amazona, 306.—*basalis*, 310.—*Blanchardi*, 308.—*brasiliensis*, 307.—*Bretinghami*, 170.—*brevicornis*, 317.—*carinata*, 174.—*clypeata*, 172.—*cognata*, 168.—*concinnipennis*, 170.—*divergens*, 301.—*Erichsoni*, 175.—*fuscomaculata*, 174.—*gravida*, 302.—*Haroldi*, 306.—*labiata*, 305.—*laticeps*, 315.—*laticollis*, 316.—*madagascariensis*, 309.—*malayana*, 312.—*megalopoides*, 173.—*mexicana*, 173.—*natalensis*, 166.—*nitens*, 312.—*pallidicornis*, 303.—*parvula*, 310.—*persica*, 167.—*propinqua*, 314.—*robusta*, 171.—*rugiceps*, 309.—*Sallei*, 302.—*separata*, 304.—*squarrosa*,

Digitized by Google

COLEOPTERA—*continued.*

169.—*Steinheili*, 304.—*submetallescens*, 175.—*Wallacei*, 171.—*Waterhousei*, 315.—*Westwoodi*, 311.—*Wilsoni*, 313.—*Wollastoni*, 167.

Chariderma, 28.—*C. pulchella*, 29.

Clitea, 287.—*C. picta*, 287.

Cocoon of one of the *Cetoniidæ* from Cameroons, vi.

Cænobius chinensis, 214.—*discoidalis*, 212.—*fulvipes*, 213.—*lividipennis*, 211.—*ruficollis*, 212.

Colaspis Lefevrei, 37.

Colorado beetle, appearance in Ontario and Cologne, xiv.—Memorandum by Canadian Minister of Agriculture, xiv.

Creophilus erythrocephalus, from N. Zealand, viii.—resemblance to a *Forficula*, viii.

Crepidodera africana, 159.—*collaris*, 161.—*costipennis*, 161.—*japonica*, 160.—*parallela*, 162.—*vestita*, 162.

Cryptocephalus amazonus, 221.—*gratus*, 220.—*histrionicus*, 221.—*Jansoni*, 218.—*notatipennis*, 219.

Cyphodera, 25.

Dermestes vulpinus destructive to hides and cork, xxii.

Diastetropis olivaceus, 11.

Dibolia Duboulayi, 182.

Dioryctus Mouhoti, 86.

Docema collaris, 293.

Dokrnia miranda, from N. Zealand, viii.

Elytrurus angulatus, 9.—*divaricatus*, 10.—*expansus*, 8.—*serrulatus*, 10.

Epiphlæus capitatus, 248.—*Chevrolati*, 246.—*nitidus*, 248.—*pulcherrimus*, 246.—*terzonatus*, 247.—*velutinus*, 247.

Eumolpus australis, 50.—*Batesii*, 53.—*carinatus*, 54.—*ignitus*, Fab., 46.—*imperialis*, 51.—*nitidus*, 48.—*prasinus*, Erichs., 55.—*separatus*, 47.—*speciosus*, 52.—*surinamensis*, Fab., 49.

Eupholus Bennettii, from New Guinea, xv.

Euphyma, 224.

Euplectroscelis bimaculata, 320.—*Deyrollei*, 319.—*nigripennis*, 321.—*placida*, 320.—*sordida*, 321.—*tibialis*, 319.

Gymnusa brevicollis, from Chobham, vi.

Haltica amazona, 163.

Haploscelis abdominalis, 13.

Hydnocera flavifemorata, 261.—*Guatemalæ*, 261.—*marginata*, 260.—*olivacea*, 262.—*pallipes*, 261.—*rufithorax*, 262.—*virescens*, 262.

Ichnea Bateviana, 412.—*disjunota*, 411.—*Fryana*, 415.—*fumigata*, 414.—*funesta*, 410.—*impressocollis*, 414.—*incerta*, 413.—*mimica*, 412.—*mitella*, 411.—*nitida*, 415.—*obscura*, 414.—*plumbea*, 413.—*subfasciata*, 410.—*vitticollis*, 415.

Idiocephala, Saund., 31.—*I. bella*, 225.—*Chapuisii*, 224.

Iridotænia cuprecovaria, 5.—*purpurcipennis*, 5.

Isolomidia, 257.—*I. apicalis*, 259.—*Batesi*, 259.—*pulchella*, 258.—*subtilis*, 259.

Digitized by Google

COLEOPTERA—*continued.*

Lamellicorn beetles, Westwood's remarks on certain new species, xxvi.

Larva of a beetle destructive to mangolds, xv.

Lemidia bifurcata, 256.—*concinna*, 255.—*dia*, 252.—*elongata*, 253.—*filiformis*, 254.—*interrupta*, 252.—*labiata*, 256.—*maculicollis*, 252.—*obliquefasciata*, 251.—*pilosa*, 255.—*plumbea*, 257.—*rufa*, 251.—*subænea*, 254.—*suturalis*, 255.

Leptophysa, 165.—*L. Batesii*, 166.

Longitarsus amazonus, 177.—*Buckleyi*, 291.—*capensis*, 292.—*concinnus*, 290.—*Fryellus*, 291.—*scutellatus*, 177.—*Wallacei*, 292.

Mathesis, 7.—*M. guttigera*, 8.

Megistops ornatus, 322.—*pretiosus*, 322.

Melixanthus Adamsi, 216.—*placidus*, 217.

Metallactus eximius, 230.

Monachus angulicollis, 215.—*obscuricollis*, 215.

Monohammus sutor, captured in London, iv.—*titillatus*, captured in Birkenhead, xxii. and xxv.

Mylassa, Stål, 32.

Narycius smaragdulus, the two sexes exhibited, xvii.

Nascio Enysi, 7.

Nisotra Breweri, 157.

Nodostoma Bevani, 40.—*Dormeri*, 39.—*magnificum*, 38.—*tricolor*, 38.

Nyetra, 33.—*N. forcipata*, 34.

Ochrosopsis, Saund., 30.—*O. erudita*, 30.

Pachybrachys contortus, 231.

Pachyta sexmaculata, new to Britain, xix.

Paracadmus, 227.—*P. lucifugus*, 228.

Paracephala, 222.—*P. pectoralis*, 223.

Passalus, species destroying cocoa-nut trees in Barbadoes, xxi.

Paussotropus, 3.—*P. parallelus*, 3.

Pelonium Badeni, 420.—*bipunctatum*, 421.—*confluens*, 423.—*difforme*, 420.—*extraneum*, 424.—*irroratum*, 422.—*maculosum*, 424.—*micans*, 421.—*optabile*, 419.—*pictipenne*, 423.—*ridens*, 422.—*ruficolle*, 419.—*semirufum*, 420.

Philonthus cicatricosus, from Shoreham, vi.

Phygasia limbata, 290.

Phyllotreta Cumingii, 179.—*Downesi*, 300.—*jamaicaensis*, 299.—*malayana*, 300.—*orientalis*, 178.

Plociomerus luridus, from Chobham, vi.

Polyphylla fullo, taken on a vessel at Antwerp, xxvi.

Porrostoma abdominale, 75.—*apicale*, 77.—*brevirostre*, 74.—*cinctum*, 80.—*clientulum*, 81.—*dichroum*, 86.—*elegans*, 75.—*erythropterum*, 74.—*fallax*, 79.—*hæmorrhoidale*, 79.—*inquinulum*, 81.—*irregulare*, 76.—*laterale*, 74.—*limbatum*, 81.—*lineatum*, 78.—*lugubre*, 80.—*plagiatum*, 80.—*rufipenne*, Fab., 74.—*russatum*, 77.—*salebrosum*, 79.—*scalare*, 79.—*textile*, 77.—*togatum*, 78.—*uniforme*, 76.

Prasonotus morbillosus, 35.—*ruficaudis*, 35.

Digitized by Google

COLEOPTERA—*continued.*

Prionopleura, Saund., 27.
Pseudocolaspis eximia, 44.—*rigida*, 43.
Pseudodera orientalis, 286.
Psiloptera scintillans, 6.
Psylliodes Chapuisii, 183.
Pyticera coronata, 416.—*flavicollis*, 416.
Rhombosternus pretiosus, 226.
Rhyncophora of New Zealand, remarks by Dr. Leconte, x.—remarks by Mr. Pascoe, xi.
Rhyparida formosa, 40.—*Howitii*, 41.
Scelodonta albidovittata, 42.—*bidentata*, 43.
Sebæthe fulvipennis, 164.—*nigricornis*, 164.—*torrida*, 165.
Sphæroderma apicipennis, 180.—*ornata*, 180.
Sphenoptera andamanensis, 6.
Stegnaspea, 181.—*S. Trimeni*, 182.
Stegnocephala, 32.—*S. discoidalis*, 222.
Stenaspis plagiata, 12.
Stenophyma, 176.—*S. elegans*, 176.
Stenus Kiesenwetteri, from Chobham, vi.
Systena cæruleata, 289.—*Deyrollei*, 288.—*ornata*, 288.
Telephori, habits of, 279.
Tenerus andamanensis, 405.—*apicalis*, 408.—*ceramensis*, 403.—*chalybeus*, 405.—*cruentatus*, 403.—*cyaneus*, 404.—*difficilis*, 407.—*discolor*, 406.—*doreyanus*, 405.—*flavicollis*, 404.—*fuscipennis*, 406.—*incertus*, 408.—*javanus*, 404.—*melanurus*, 409.—*mindanaonicus*, 407.—*Parryanus*, 402.—*persimilis*, 408.—*siamensis*, 402.
Teretrius picipes, taken at Norwood, xv.
Tillus unifasciatus, taken at Norwood, xiii.
Toxotus meridianus, habits of, 279.
Trichalus, 82.—*T. ampliatus*, 83.—*discoideus*, Er., 82.—*flavopictus*, 82.—*serraticornis*, 84.—*sulcatus*, 83.
Xenidea purpureipennis, 318.—*Wallacei*, 318.

CRUSTACEA.

Isopod Crustacean parasitic on a flying fish, iv.
Spheroma, species of, possessing stridulating powers, xxvii.

DIPTERA.

Bombylii flying in company with an *Anthophora*, ii.
Culex, species in Spitzbergen, xxvi.
Drosophila cellaris destructive to pickles, xv.
Systropus macer bred from cocoon of *Limacodes hyalinus*, ii.

HEMIPTERA.

Aphalara polygoni, from Sevenoaks and Addington, ix.
Cicada montana, supposed stridulation of, xiii.—Further remarks thereon, xvi.

Digitized by Google

HEMIPTERA—*continued*.

Coccidæ, Herr Grevelinck's remarks on destruction of cocoa-nut trees in Barbadoes by, xx.
Epora subtilis, strepsipterous parasite on, 185.
Eurybrachys spinosa attacked by a Lepidopterous parasitic larva, xix. and xxiii.—Remarks on the habits by Mr. Wood-Mason, xxiii.—Discussion, xxiv.
Fauna of Arctic Siberia, Remarks by Dr. Sahlberg, iv.
Homopterous insect with Lepidopterous parasite, xix.
Oncocephalus subspinosus, from West Coast of Africa, xxxii.
Plant bug from Bahia causing blisters on an Orchid leaf, xiii.
Psyllidæ, new and rare British species, ix.—A field for discovery, ix.
Tetroxia Beauvoisii, from West Coast of Africa, xxxii.
Tettigometra impressopunctata, a rare species, xxvi.
Typhlocyba debilis, a rare species, xxvi.

HYMENOPTERA.

Abraxas grossulariata, sensitive to sounds, xxxiv.
Anoyloneura, 91.—*A. varipes*, 92.
Anthophoræ and *Bombylii* flying in company, ii.
Athalia spinarum, var. *orientalis*, 90.
Belesces fulvus, 88.
Bombus, the genus not found in Spitzbergen, xxvi.
Hylotoma bipunctata, 90.—*excisa*, 90.—*interstitialis*, 91.—*simlaensis*, 91.
Hymenoptera, from Calcutta exhibited, xvii.
Macropis labiata, at Norwich, xxxii.
Mymar, species from Ceylon, xvii.
Myrmica ruginodis, sound caused by, xv.
Pachyprotasis rapæ, 88.
Phyllotoma aceris, a sawfly causing blisters on species of *Acer*, xvii.
Pseudomyrma, 58.—*P. brunnea*, 63.—*canescens*, 66.—*distincta*, 63.—*elongata*, 67.—*ferruginea*, 64.—*fervida*, 65.—*flavicornis*, 67.—*læviceps*, 63.—*lævigata*, 62.—*penetrator*, 66.—*pilosula*, 62.—*rufa*, 64.—*rufomedia*, 66.—*sedula*, 67.—*simplex*, 64.—*terminalis*, 64.—*unicolor*, 68.—*urbana*, 65.—*variabilis*, 62.—*volatilis*, 66.
Rophites quinquespinosus, near Hastings, xxxii.—new British species, xxxii.
Siobla, 88.—*S. Mooreana*, 89.
Tenthredo latifasciata, 87.—*simulans*, 87.
Tetraponera, 68.—*T. Æthiops*, 71.—*allaborans*, Wlk., 69.—*attenuata*, 71.—*petiolata*, 70.—*punctulata*, 72.
Vespa orientalis, case of "mimicry," xxxiii.

LEPIDOPTERA.

Acherontia Sculda, 242.
Achlyodes ecliptica, 154.—*exosa*, 155.—*nyctineme*, 155.

Digitized by Google

LEPIDOPTERA—*continued.*

Adelpha juruana, 115.
Æmene guttulosana, Wlk., 373.—*sordida*, 372.
Æthilla infanda, 149.
Aleuron Butleri, 240.
Ammatho carnipicta, 342.—*fuscescens*, 343.—*hieroglyphica*, 343.—*roseororatus*, 341.
Antheræa Hübneri, 20.
Argina notata, 365.
Barsine exclusa, 340.—*mactans*, 340.—*natalensis*, Wlk., 341.
Bhutanitis Lidderdalii, exhibited, i.
Bizone javanica, 338.—*pallens*, 338.—*perversa*, 338.
British Lepidoptera, varieties of, ii.—ditto, taken in Wales, iv.
Bunæa Alsauga, 18.—*Thomsonii*, 19.
Calamidia, 358.
Callatolmis, 348.
Cartea Trailii, 129.
Case-bearing larva parasitic on a Homopterous insect, xix.
Caterpillars, food of gaily-coloured, 205.—remarks thereon, xi.—Discussion, xii.
Ceratinia castanea, 109.
Chærocampa aspersata, 241.—*erotus*, var., 242.—*Johanna*, 241.—*margarita*, 240.—*Walduckii*, 398.
Chrysæglia, 356.
Chrysorabdia splendens, 357.
Cisthene minuta, 327.
Cleora glabraria, dark variety of, x.
Colias Edusa, ♂, observed in Dorset, in June, xiii.—occurrence in Dumfriesshire, xiv.—common at Colchester, xiv.—a second brood observed at Norwood, xv.
Cossus ligniperda, larvæ taken in large numbers in a willow, xvi.
Crambomorpha splendens, 357.
Danais Archippus, specimen taken in Sussex, i.—geographical distribution of, 93.—discussion, v.
Daptonura pedrosina, 144.
Deiopeia pura, 360.—*thyter*, 361.
Digama fasciata, 362.—*marmorea*, 363.
Diludia Bethia, 243.
Dyphlebia elegans, 347.—*tricolora*, 347.
Echenais mollis, 133.—*sordida*, 133.
Epatolmis, 348.
Ephyra punctaria, remarks on seasonal dimorphism, vi.
Epipyrops, parasitic on a Homopteron, xxiii.—Wood-Mason's remarks on habits, xxiii.—Discussion, xxiv.
Eubagis crata, 117.—*limbata*, 117.—*niveata*, 116.
Eudæmonia Argiphontes, 20.
Eudule sanguinea, 368.
Eutane maculata, 335.

Digitized by Google

LEPIDOPTERA—*continued*.

Gonepteryx Rhamni, 5-winged specimen, xxvi.—hermaphrodite specimen, xxvi.

Goniurus esmeraldus, 146.

Hemaris Cyaniris, Guér., 239.

Himantoides, 395.—*H. undata*, Wlk., 240.

Himantopterus, remarks on the genus, 437.—believed to belong to the Lepidoptera, xvii.

Hypædalea, 397.—*H. insignis*, 398.

Josoides fallax, 331.—*inconstans*, 332.—*indecisa*, 332.—*obscura*, 332.—*variana*, 331.

Larva case found on a Mimosa from Zanzibar, probably allied to *Psyche* or *Oiketicus*, ii.

Lasiocampa quercus, case of Parthenogenesis, xix.

Lepidoptera from Siam, v.—from China, xix.—from Ceylon and the Nicobar Islands, xxiv.—from Grinnell Land, xxv.—Remarks by Mr. Eaton, xxv.

Leptidula, 368.—*L. sordida*, 369.

Leucothyris perspicua, 107.

Limacodes hyalinus, a Dipteron bred from the cocoon, ii.

Lithosia decreta, 351.—*fraterna*, 349.—*innotata*, 352.—*kingdoni*, 353.—*punctocollis*, 353.—*Sarawaca*, 350.

Lithosiidæ in the British Museum, 325.

Lycæna Arion, dwarf specimens, xxiv.

Mæpha plicata, 328.—*scsapina*, 329.

Mesene trucidata, 131.

Mesoscmia Maria, 128.—*sylvicolens*, 127.

Nephele Charoba, 243.—*infernalis*, 244.

Nepita ægrota, 336.—*limbata*, 336.—*ochracea*, 336.

Notodonta trilophus, from Ipswich, vi.

Nymphidium cavifascia, 135.—*stibopteris*, 135.

Ophideres materna, taken at sea, v.

Orthosia suspecta, melanic var., iv.

Otus versicolor, 396.

Pallene elegans, 334.—*gracilis*, 377.

Pamphila allubita, 151.—*alumna*, 151.—*ancillaris*, 151.—*chydæa*, 152.—*compta*, 152.—*confixa*, 152.—*evans*, 153.—*sodalis*, 150.—*stictomenes*, 153.

Papilio opalinus, 145.

Parasitism among Lepidoptera, 433.

Pieris brassicæ, a gynandromorphous specimen, xxvi.—*P. rapæ* attacked by *Microgaster*, xxvi.

Protoparce Dalica, 243.

Psyche, said to have been produced from pupa case of a *Tachina*, xxiii.

Pteroodes, 376.

Rhopalocerous forms in S. Africa, variation of, 265.—Remarks by Mr. Mansel Weale, xiv.

Saturniidæ, notes on African, 15.

Digitized by Google

LEPIDOPTERA—*continued.*

Sesapa complicata, 344.—*erubescens*, 345.—*icharina*, 345.
Setina accepta, 369.
Stalachtis Trailii, 137.
Stenolopsis, 375.—*S. exposita*, 375.
Stenoplastis venata, 359.
Symmachia punctata, 130.
Tagiades astrigera, 155.
Talara coccinea, 329.
Tatargina, 366.—*T. formosa*, 366.
Telegonus labriaris, 148.
Teulisna Bertha, 355.—*biplagella*, 355.—*oblonga*, 355.
Thymara, remarks on the genus, 437.
Tigrioides, 359.
Tmolus atrox, 140.—*olitumnus*, 140.—*pereza*, 140.
Trichromia strigosa, 328.

NEUROPTERA.

Anabolia nervosa, on structure and habits, xxiii. 431.
Case of *Phryganea*, resembling shells, xiii.
Dragon-fly (*Gynacantha plagiata*) from Borneo, x.
Notiothauma, 427.—*N. Reedi*, 429.
Prosopistoma, notes on the genus, 189.
Pupa of a Trichopterous insect, 431.

ORTHOPTERA.

Forficula erythrocephala, from New Zealand, viii.—resemblance to a *Creophilus*, viii.
Gongylus gongylodes, simulates a flower, xxix.—specimen exhibited, xxxiii.
Œdipoda, possessing stridulating organs, xxix.
Phyllothelys Westwoodi, a Mantis exhibited, xviii.—Distinction in the sexes, xviii.
Pterynoxylus, possessing stridulating organs, xxix.

STREPSIPTERA.

Colacina insidiator, parasitic on a species of *Homoptera*, 185.
Stylopidæ, on adult larvæ and their puparia, 195.

Digitized by Google

LONDON:
PRINTED BY C. ROWORTH AND SONS,
NEWTON STREET, W.C.

Digitized by Google

THE

TRANSACTIONS

OF THE

ENTOMOLOGICAL SOCIETY

OF

LONDON

FOR THE YEAR 1877.

I. *Descriptions of twenty new species of* Coleoptera *from various localities.* By Chas. O. Waterhouse.

[Read 6th December, 1876.]

List of Species.

Catascopus cupreicollis.
Adelotopus collaris.
„ marginatus.
Paussotropus (g. n.) parallelus.
Alaus nodulosus.
Iridotænia cupreovaria.
„ purpureipennis.
Psiloptera scintillans.
Sphenoptera andamanensis.
Nascio Enysi.
Mathesis (g. n.) guttigera.
Elytrurus expansus.
„ angulatus.
„ divaricatus.
„ serrulatus.
Diastatropis olivaceus.
Bradycnemis (g. n.) velutina.
„ anomala.
Stenaspis plagiata.
Haploscelis abdominalis.

CARABIDÆ.

Catascopus cupreicollis, sp. n.

Supra cupreo-æneus, subnitidus; thorace cupreo, elytris striis fortiter impressis, interstitio septimo costulato, corpore subtus æneo, coxis abdomineque piceis.

Long. 4⅔ lin.; lat. 1⅔ lin.

Head with some fine longitudinal scratches on the vertex; clypeus coppery. Thorax coppery, a trifle broader than long, central channel very deep, the sides in front of the usual lateral seta nearly parallel (scarcely

Digitized by Google

arched at the anterior angles), rather strongly sinuate behind the lateral seta, so that there is a somewhat distinct angle where the seta is situated; the posterior angles diverging, a little less than right angles. Elytra obscure æneous, very strongly striated, the striæ deeply impressed at the base, the three lateral striæ (and the others at the base) distinctly punctured, the interstices rather convex, the fifth rather more so than the others, the seventh subcarinate at the base; the outer angle made by the apical truncature rounded, the sutural angle blunt.

This species closely resembles what I have determined to be *C. æneus*, Mots., and differs chiefly in the coloration of the thorax, which is more distinctly angulated at the side than in the middle; the head is not distinctly punctured behind the eyes and on the neck as it is in *C. æneus*.

Hab.—Andaman Is. (R. Meldola, Esq.) Brit. Mus.

Adelotopus collaris, sp. n.

Elongato-oblongus, convexus, nitidissimus, nigro-piceus; thorace, elytris maculis duabus rotundatis, abdomineque rufo-testaceis.

Long. 2 lin.; lat. $\frac{4}{5}$ lin.

Head broad, arched. Thorax $\frac{1}{4}$ broader than long, very convex (the margins not visible from above), a little narrowed towards the front, the anterior angles rounded. Scutellum reddish-testaceous. Elytra not quite twice as long as the thorax, nearly parallel at the sides, truncate at the apex, the outer angle rounded off; the suture, the lateral margin and the extreme apex are pitchy; each elytron has a large round yellowish spot a little behind the middle. The whole of the underside and the apical segment of the abdomen, which is visible from above, are reddish-yellow.

Hab.—Siam (J. C. Bowring, Esq.). Brit. Mus.

Adelotopus marginatus, sp. n.

Oblongus, convexus, nitidissimus, lævis, nigro-piceus; thorace limbo, elytris marginibus maculisque duabus obliquis piceo-rufis; corpore subtus piceo-testaceo.

Long. 2 lin.; lat. $1\frac{1}{5}$ lin.

Head blackish, margined with pitchy-red. Thorax $\frac{1}{4}$ broader than long, very convex (the lateral margins not visible from above), gently narrowed in front, the angles rounded; the lateral margins and posterior border are

Digitized by Google

pitchy-red. Elytra scarcely broader than the thorax, parallel, as broad as long, conjointly arcuate at the apex, the margins and apex pitchy-red; each elytron with an oblique post-mesial oblong red spot, which joins the margin but does not quite reach the suture.

Hab.—Java (J. C. Bowring, Esq.). Brit. Mus.

PAUSSOTROPUS, gen. nov.

Labial palpi with the basal joint small and triangular, the second obconic, the apical joint subquadrate, a little narrowed at the base; maxillæ with the inner lobe strong, claw-like; maxillary palpi with the basal joint very small, the 2nd and 3rd larger, subquadrate; the apical joint not quite as long as the two preceding taken together, narrowed towards the apex, which is blunt. Mandibles broad, flat, bent and acuminate at the apex. Antennæ eleven-jointed, very short, inserted in a deep excavation between the eye and the base of the mandible; the basal joint elongate, 2nd short, 3rd obconic, 4th to 11th transverse. Thorax transverse. Elytra elongate, parallel, truncate at the apex. Legs short, compressed; tarsi short, thick, basal joint short, 2nd to 4th transverse, 5th as long as the two preceding taken together. Abdomen with five distinct segments. Prosternum arched, not produced behind.

This curious insect is closely allied to *Adelotopus*, but I have deemed it advisable to propose a new genus for its reception on account of the prosternum not being produced behind, and the tarsi being extremely short. The structure of the legs and tarsi closely resembles that of *Hylotorus* (*Paussidæ*), which has certainly five-jointed tarsi, and not four-jointed, as given by Gyllenhal.

Paussotropus parallelus, sp. n.

Elongatus, parallelus, convexus, piceo-testaceus, nitidus; capite crebre subrugoso-punctato; thorace transverso, convexo, crebre subruguloso-punctato, marginibus reflexis nitidis fere lævibus, angulis rotundatis; elytris thorace haud latioribus at 2½ longioribus, fere parallelis, fortiter, crebre, irregulariter punctatis, apice truncatis; tarsis brevibus, piceis.

Long. 3¼ lin.; lat. 1 lin.

Head broad, deflexed, very thickly and rather roughly punctured; eyes round; cheeks with a strong pentagonal lobe over the base of each mandible; the space between this

Digitized by Google

lobe and the eye is entirely occupied by a round, rather deep, shining excavation, and on the outside of this excavation is a triangular notch, which is an outlet of the excavation beneath the head in which the antennæ are inserted. Thorax nearly $\frac{1}{3}$ broader than long, scarcely narrowed in front, all the angles rounded; the disk (which has a central longitudinal impression) is thickly, closely, and somewhat roughly punctured; the lateral margins are almost impunctate and are slightly reflexed. The elytra are very strongly, rather thickly, and irregularly punctured; the margins at the base are slightly reflexed. The legs are short, compressed, and shining; the tarsi are very short, slightly narrowed towards their apex.

Hab.—Batchian (J. C. Bowring, Esq.). Brit. Mus.

ELATERIDÆ.

Alaus nodulosus, sp. n.

Elongatus, piceo-niger, opacus, dense fulvo-tomentosus; thorace longitudine $\frac{1}{6}$ angustiori, antice vix angustato, margine antico medio binodoso; elytris basi thorace vix angustioribus at duplo longioribus, apicem versus gradatim angustatis; singulo elytro plagâ laterali nigrâ.

♂. Elytris ad apicem emarginatis; abdominis segmento quinto apice truncato.

♀. Elytris ad apicem vix truncatis; abdominis segmento quinto apice rotundato.

Long. 11—16 lin.; lat. $3\frac{1}{4}$—$4\frac{3}{4}$ lin.

Closely allied to *A. putridus*, and like it in form and appearance. The thorax is of the same form and similarly raised along the middle, but the anterior margin is furnished with two approximate tubercles which project over the head (much larger, more prominent, and closer together than those in *A. putridus*); the elytra are more or less spotted with brown, and have a large brownish-black spot on the lateral margin; there is also an elongate paler spot near the base of the 4th interstice.

In the male the apex of each elytron is emarginate as in *A. putridus;* the penultimate segment of the abdomen is truncate. The female has the apex of the elytra nearly rounded, and the penultimate segment of the abdomen is rounded at the apex.

Hab.—Andaman Is. (R. Meldola, Esq.) Brit. Mus.

Digitized by Google

BUPRESTIDÆ.

Iridotænia cupreovaria, sp. n.

Elongata, angusta, ænea; thorace vittâ submarginali, lineâ medianâ, elytrorum vittâ irregulari, margineque dimidio basali (a ramâ vittæ medianæ postice juncto) cupreis.

Long. 7½—10 lin.; lat. 2½—3 lin.

Head purple-æneous, forehead deeply excavated, a smooth spot on the vertex, and the clypeus coppery; eyes rather prominent. Thorax much narrowed in front, with a slight enlargement just before the anterior angles, very little convex; disk dictinctly and not thickly punctured, the sides coarsely rogose-punctate, the mesial coppery channel well marked; the coppery stripe on each side is narrow, and extends to the anterior angle. Elytra narrowed nearly from the shoulders to the apex, rather irregularly and strongly punctate-striate; a coppery stripe (varying in width) reaches from the shoulder to about the middle of the elytron, turns a little, and then extends to the apex (this latter half is lightly impressed and finely punctured); another coppery marginal stripe extends from the shoulder to about half the length of the elytra, where it is joined by a short branch from the dorsal stripe. The under side is golden, except the thorax, which is coppery. Tarsi green.

Hab.—Andaman Is. (R. Meldola, Esq.). Brit. Mus.

Closely allied to *I. cyaniceps*, F., but has the elytra more regularly attenuated, and the stripes are quite different, not straight, as in the allied species.

Iridotænia purpureipennis, sp. n.

Elongata, nitida; capite thoraceque æneo-cyaneis, hoc lateribus plagâ ovali cupreâ ruguloso-punctatâ notatis; elytris purpureis (dorsim æneo-micantibus), irregulariter striato-punctatis, usque ad medium fere parallelis, dein ad apicem attenuatis, marginibus serratis; corpore subtus læte cupreo-aureo; antennis, tibiis, tarsisque viridibus.

Long. 16 lin.; lat. 4¾ lin.

Head and thorax deep blue, tinged with æneous; forehead deeply excavated, and with a deeply impressed central line; clypeus coppery. Thorax distinctly and not thickly punctured, narrowed in front of the middle, and with a slight swelling just before the anterior angles; central line only impressed posteriorly; each side has a large, oval, coppery spot close to but not quite reaching the margin. Elytra a little broader than the thorax at the

Digitized by Google

base, sub-parallel for about two-thirds their length and then narrowed to the apex; distinctly but not very strongly striate-punctate; of a deep purple colour (especially at the sides), but, when seen laterally, of a bright olive-green.

Hab.—Andaman Is. (R. Meldola, Esq.)

Psiloptera scintillans, sp. n.

Elongata, elliptica, nitens, æneo-cupreo-varia; thorace cupreo, antice angustato, punctato, lateribus rugosis; elytris basi thorace vix latioribus ad apicem angustatis, singulis lineis elevatis nitidis quatuor nigris, interstitiis cupreis, crebre rugulosis et viridi-punctatis, apice truncato, angulo externo breviter spinoso; corpore subtus cupreo, fortiter rugoso-punctato; tarsis viridibus.

Long. 8—12 lin.; lat. $2\frac{3}{4}$—$4\frac{2}{3}$ lin.

Most nearly allied to *Ps. viridicuprea*, Saund., but very distinct from all the species of the genus by the strong costæ on the elytra. Head very rugose. Thorax about one-third broader than long, narrowed anteriorly, especially in front of the middle, with a smooth central line; the disk not thickly punctured; the sides rugosely punctured, the punctures golden-green. Elytra three times and three-quarters longer than the thorax, but scarcely wider at the base, gently narrowed from the shoulders to the posterior two-thirds, and then more suddenly narrowed to the apex; each elytron with four black shining costæ, the interstices rough, and rather thickly punctured, the punctures green. The whole under side coppery, frosted; middle of the sterna smooth.

Hab.—Andaman Is. (R. Meldola, Esq.) Brit. Mus.

Sphenoptera andamanensis, sp. n.

Elongata, nigra, nitida; clypeo cupreo; thorace longitudine $\frac{1}{4}$ breviori, sat crebre distincte punctulato, ante medium oblique angustato, lateribus postice parallelis; scutello transverso; elytris basi thorace paulo latioribus et triplo longioribus, postice angustatis, striato-punctatis, singulis apice trispinosis; corpore subtus æneseenti.

Long. $5\frac{1}{4}$ lin.; lat. $1\frac{4}{5}$ lin.

The whole upper surface is closely and very finely punctured, which renders the larger punctures (especially on the elytra) less well defined. The head and thorax are somewhat thickly punctured with the larger punctures; the latter is obliquely narrowed in the anterior third; the sides parallel for the posterior two-thirds; the anterior

Digitized by Google

margin is nearly straight (only very slightly sinuate at each side). Elytra a little broader than the thorax, attenuated posteriorly, moderately distinctly striate-punctate, each puncture traversed by two short striæ; the apex of each elytron with three acute teeth, the sutural one less acute, the second the longest, the outer one about twice the distance from the second that the second is from the sutural one, receding from the apex.

In some lights two faint purple spots are visible on the margins of the elytra.

Hab.—Andaman Is. (R. Meldola, Esq.) Brit. Mus.

This species is closely allied to *Sph. maculatus*, L. & G., but is relatively broader and less suddenly attenuated behind. The thorax is distinctly transverse and the punctuation is different, the larger punctures being equally distributed over the surface, and the fine punctuation throughout is more distinct.

Nascio Enysi, Sharp.*

Statura fere *N. Parryi*, elongata, angusta, ænea, nitida; thorace longitudine ¼ latiori, antice parum angustato, crebre rugoso-punctato; elytris fortiter punctato-striatis, interstitiis dorsalibus fere æqualibus lævibus, lateribus rugoso-punctatis; singulo elytro maculis duabus, obliquis flavis notato.

Long. 3⅔ lin.; lat. 1¼ lin.

Forehead shining coppery. Thorax scarcely narrowed in front, posterior angles somewhat acute and projecting; hind margin with a shallow central impression. Elytra a little broader than the thorax, narrowed at the apex which is quadri-spinose, the two central spines short (made by the suture being produced). Each elytron has two oblong yellow spots—one before, the other behind the middle.

Hab.—N. Zealand (Major Parry and C. M. Wakefield, Esq.). Brit. Mus.

CLERIDÆ.

Mathesis, gen. n.

Antennæ with the basal joint obconic, the 2nd round, the 3rd a little elongate, the 4th to 8th gradually shorter,

* When I read this paper I gave this species the name *N. quadriguttata;* in the Feb. number, however, of the Ent. Month. Mag. p. 193, Mr. Sharp has described it under the name of *Bruprestis Enysi.* It certainly is *not* a *Bruprestis*, but a *Nascio.*

Digitized by Google

the 9th to 11th forming a loose club, as long as all the preceding joints taken together. Palpi with the terminal joint securiform. Tarsi not broad, the 3rd joint not bilobed, furnished with a well-developed lamina; claws with a very small basal tooth.

This genus appears to me most nearly allied to *Eburifera*, from which it differs in the long club to the antennæ, and in not having the 3rd joint of the tarsi (which are much less broad) bilobed.

Mathesis guttigera, sp. n.

Elongata, parallela, violacea, nitida, parce longe pubescens; elytris guttis quatuor flavis ornatis; femoribus basi piceo-testaceis.

Long. 3¼ lin.; lat. 1 lin.

Of a beautiful shining blue, tinged with purple on the elytra. Antennæ long, pitchy at the base, the club long and flat; the apical joint elongate-ovate, a little shorter than the preceding joint. Thorax gently convex, scarcely broader than the head, broadest in the middle, almost impunctate. Elytra a little broader than the thorax, parallel, convex, rounded at their apices, with no distinct punctuation: each elytron has a small yellow spot about one-third from the base near the suture, and a second larger spot on the margin, about the middle.

Hab.—New Zealand (C. M. Wakefield, Esq.). Brit. Mus.

This beautiful little species has much the same form and colouration as *Zorion guttigerum* among the *Cerambycidæ*, and is probably parasitic upon it, as Mr. Wakefield informs me that the two insects are found associated.

CURCULIONIDÆ.

Elytrurus expansus, sp. n.

Niger, squamulis minutis sabulosis tectis; rostro lineâ longitudinali elevatâ nitidâ; thorace longitudine paulo latiori, antice posticeque fere recte truncato, sat convexo, granulis sat magnis (ad latera parvis) dense instructo, lateribus arcuatim rotundatis; elytris basi thorace haud latioribus, dorsim planatis (suturâ solum paulo convexâ), postice duplo latioribus, fortiter striato-punctatis, lateribus

Digitized by Google

ante apicem in dente magno nitido expansis, apice acute producto, deflexo.

Long. 8 lin.; lat. elytr. 4⅓ lin.

Head with an elevated line commencing between the eyes and extending to the apex of the rostrum. Thorax gently convex, covered with rather large shining granules, which become smaller and less close at the sides; the sandy-coloured scales form a small spot next the scutellum. Elytra at their base not broader than the thorax, becoming regularly broader for two-thirds their length, where the margin is more suddenly expanded into a large somewhat triangular up-turned projection; from this projection to the apex the elytra are very much narrowed and deflexed, the apex of each being acute; the sides are only carinate just before the lateral projection; the dorsal region is rather flat, gently convex at the suture, distinctly striate-punctate, the interstices not distinctly granular except at the sides.

Hab.—Ovalau (W. Wykeham Perry). Brit. Mus.

Elytrurus angulatus, sp. n.

Ater; rostro lineâ elevatâ nitidâ; thorace granuloso; elytris basi thorace haud latioribus, postice ⅔ latioribus, supra granulis nitidis adspersis, ante apicem utrinque fortiter excisis, apice acuminato.

Long. 7 lin.; lat. elytr. 3⅓ lin.

Much resembles the preceding species in form. The thorax is a trifle narrower, but scarcely broader than long. The elytra somewhat flattened, gently convex on the disk, becoming regularly broader from the base to the posterior two-thirds, from thence to the apex strongly emarginate and acuminate, whence it happens that the margin has at one-third from the apex a large, triangular tooth, as in the preceding species, but it does not project laterally, as in *E. expansus*, and its outer edge is a continuation of the lateral carina (which in this species is continued to the shoulder). The whole upper surface is moderately thickly covered with small, round, shining tubercles, and there are no rows of punctures, as in the preceding species. The apices of the elytra are a little separated from each other, and are less acute than in *E. expansus*.

Hab.—Viti Levu. Brit. Mus.

Digitized by Google

Elytrurus divaricatus, sp. n.

Elongato-ellipticus, niger, squamulis sabulosis dense tectus; rostro obsolete tricarinato; thorace tuberculis nitidis adspersis; elytris vix convexis, ante medium rotundato-ampliatis, apicem versus angustatis, apicibus acuminatis divaricatis, supra striato-punctatis, punctis squamiferis, interstiis tuberculis parvis vix perspicuis parce adspersis.

Long. 6 lin.; lat. elytr. $2\frac{1}{4}$ lin.

Rostrum with a central, longitudinal carina, and on each side of it a less distinct, oblique, slightly interrupted ridge. Antennæ with the 2nd joint of the funiculus about one-third longer than the 1st. Thorax scarcely broader than long, gently convex, with not very small, shining tubercles sparingly scattered over the surface; a little narrowed in front, the sides slightly arcuate, sub-parallel behind the middle. Elytra not broader than the thorax at their base, but rather suddenly becoming broader to the basal third, and then gradually narrowed towards the apex; the apices acuminate and distinctly diverging, blunt at the tip; lineate-punctate, the punctures each filled with a scale; the sides anteriorly are somewhat rounded, and are not distinctly carinate laterally.

Closely allied to the preceding, but relatively shorter and broader; the apices of the elytra are rather more diverging and are more blunted at the tip.

Hab.—Vati (W. W. Perry, Esq.). Brit. Mus.

Elytrurus serrulatus, sp. n.

Elongatus, parum convexus, antice posticeque angustatus, squamulis parvis sabulosis et griseo-æneis tectus, granulosus; elytris lateribus subcarinatis serrulatis, apicibus parum divaricatis.

Long. $6\frac{2}{3}$ lin.; lat. elytr. $2\frac{1}{2}$ lin.

Rostrum with a broad central longitudinal shallow impression. Thorax scarcely one-fifth broader than long, gently convex, moderately closely covered with shining granules, a little more narrowed in front than behind, the sides gently rounded. Elytra not wider than the thorax at their base, three and one-third times longer, slightly arched, gradually widened to the middle and thence narrowed again to the apex, the apices somewhat acute and slightly diverging. The whole surface moderately thickly covered with very small shining granules, which have a

Digitized by Google

tendency to form rows, and which placed on the lateral carina give it a slightly serrate appearance. The antennæ are unusually long and slender, the 2nd joint of the funiculus is twice as long as the 1st. The scales which clothe the surface are sandy-coloured, except on the dorsal region of the elytra, where they are greyish-æneous.

Hab.—Vati (W. Wykeham Perry, Esq.). Brit. Mus.

ANTHRIBIDÆ.

Diastatropis olivaceus, sp. n.

Subtus niger, supra tomento olivaceo vel æneo dense tecto; oculis ovalibus vix prominulis, rostro carinâ nitidâ longitudinali distinctâ; thorace convexo, antice angustato; elytris latitudine fere $\frac{2}{3}$ longioribus, thorace latioribus, dorsim depressiusculis; antennis (clavâ exceptâ) pedibusque obscure piceis.

Long. 7—9 lin.; lat. $2\frac{1}{2}$—3 lin.

♂. Antennæ reaching to the shoulders. Elytra two-fifths longer than broad, very little narrowed at the apex, the sides gently arcuate, each with a broad velvety stripe.

♀. Antennæ reaching to the middle of the thorax. Elytra relatively a little shorter than in the male, parallel at the sides, bluntly rounded at the apex, delicately striate-punctate, the interstices alternately obscure olive and coppery-æneous.

The thorax in both sexes (although a little shorter in the ♀ than in the ♂) is about as long as broad, broadest near the base, much narrowed in front, also a little narrowed behind the fine curved ridge, which is across the broadest part, where the sides are not distinctly angular.

Hab.—Madagascar. Brit. Mus.

CERAMBYCIDÆ.

Bradycnemis, gen. n.

Characters of *Phyllocnema*, but with the thorax rounded and not angular at the sides. Prosternum horizontal, slightly produced, and cut perpendicularly behind. Posterior tibiæ very broad and compressed, gradually narrowed to their base. Antennæ [8- or] 11-jointed, rather short and stout.

Digitized by Google

Bradycnemis velutina, sp. n.

Purpureo-nigra, velutina, subtus nitida; thorace longitudine fere ¼ latiori, margine antico medio parum angulato, lateribus sub-rotundatis, basi constricto, supra nigro-velutino, subtus creberrime subtiliter punctulato, utrinque plagâ lævi; elytris parallelis, thorace vix latioribus, apice obtuse rotundatis, piceis, basi piceo-nigro; metasterno sat crebre fortiter punctato.

Long. 22 lin.; lat. 7 lin.

The antennæ are 11-jointed, about the same length as the elytra. The sides of the thorax are somewhat rounded, slightly angular behind the middle. The elytra are nearly black at the base, the posterior four-fifths pale pitchy; the pubescence dense at the base, less so towards the apex. Metasternum very broad. Abdomen with the first three segments having the posterior margin straight, the fifth gently emarginate.

Hab.—E. Indies? (J. C. Bowring, Esq.). Brit. Mus.

Bradycnemis anomala, sp. n.

Præcedenti affinis, differt tamen antennis octo articulatis, thorace lateribus bene rotundatis, subtus omnino regulariter creberrime subtiliter punctulato; elytris olivaceo-piceis, minus crebre punctulatis; abdomine piceo, segmentis omnibus apice leviter emarginatis.

Long. 21 lin.; lat. 6 lin.

I am very much perplexed as to what to do with this insect. In spite of the anomalous antennæ (which are two-thirds the length of the elytra, and are quite perfect), it appears to me to be congeneric with the preceding, which it closely resembles in other respects. May the two insects possibly be sexes?

Hab.—Penang (J. C. Bowring, Esq.). Brit. Mus.

Stenaspis plagiata, sp. n.

Elongata, parallela, piceo-castanea, nitida; fronte lævi, canaliculatâ; thorace longitudine fere duplo latiori, convexo, confertim ruguloso, lateribus medio bene angulatis, disco impressionibus quinque nitidis nigris, margine postico flavo; scutello fere lævi; elytris thorace vix angustioribus apicem versus parum angustatis, crebre

Digitized by Google

fortiter punctatis, singulis plagis tribus flavis (nigro-cinctis) notatis.

Long. 21 lin.; lat. 7 lin.

The head and thorax are rather darker than the elytra. The elytra have a black band across, about one-third from the base, in which are four yellow spots; at about one-third from the apex there is on each elytron a yellow reniform spot which is surrounded with black.

Hab.—Guatemala (O. Salvin, Esq.). Brit. Mus.

ENDOMYCHIDÆ.

Haploscelis abdominalis, sp. n.

Ovalis, atratus, subnitidus, lævis; thorace leviter convexo, basi medio haud marginato; elytris convexis, apicem versus arcuatim angustatis; tibiis anticis intus dente acuto armatis; abdomine medio impressione magnâ.

Long. 4½ lin.; lat. 2½ lin.

General form and appearance of *H. atratus*, ♀, but with the elytra much less acuminate at the apex. The club of the antennæ is much less broad. The thorax is gently convex, not very deeply emarginate in front, the anterior angles not very prominent, nearly rectangles; the sides margined, gently sinuate before the posterior angles, which are a little less than right-angles; the base has the usual two foveæ, but is not margined between them. The elytra have the sides arcuate. The anterior tibiæ are dilated on the inside (a little beyond the middle) into a strong tooth. The abdomen has a deep central impression which occupies the 2nd to 4th segments and encroaches on the margin of the 1st, the sides of the impression are elevated.

Hab.—Madagascar. Brit. Mus.

Digitized by Google

Digitized by Google

II. *Notes on the African* Saturniidæ *in the Collection of the Royal Dublin Society.* By W. F. Kirby, Assistant Naturalist, R.D.S.

[Read 7th February, 1877.]

The *Saturniidæ*, although a very favourite group with most Entomologists who interest themselves in moths, are but little known, because they have not been systematically collected like the butterflies, and hence specimens are rarely to be obtained, except by accident. Some time ago, however, the Royal Dublin Society purchased a large collection of insects of all orders which had been formed by a gentleman at Sierra Leone; and has subsequently acquired other specimens from Africa, including (through the kindness of Mr. D. G. Rutherford) some of those collected by Mr. G. Thomson of Glasgow, at Camaroons. Generally speaking African *Saturniidæ* are only to be obtained singly, and then not always in the best condition. I give below a list of the species at present contained in the Dublin Collection.

Genus Bunæa, Hübn.

1. *B. Aslauga*, n. sp., *infra*. Madagascar.

This is probably the species described by Boisduval, Faun. Mad. p. 88, as *Alcinoe*, Cram., from which the different position of the ocellus of the hind wing will at once distinguish it.

2. *B. Nyctalops*, Wallengr. Natal.

This common species varies considerably in size, and commonly goes under the name of *Alcinoe*, Cram. [Stoll], from which it is certainly distinct. It is, however, possibly a variety of *B. Caffraria*, Stoll (t. 31, f. 2, 2 C.), though I am at present more inclined to consider it a distinct species. It has been well figured as *B. Alcinoe* by Mr. Butler in his series of card illustrations of Tropical Butterflies and Moths.

Digitized by Google

3. *B. Angasana*, Westw. Natal.

4. *B. Thomsonii*, n. sp., *infra*. Camaroons.

5. *B. Eblis*, Streck. Camaroons.

A single specimen, very badly rubbed, but differing in no respect from the description.

6. *B. Nictitans*, Fabr. Sierra Leone.

7. *B. Tyrrhena*, Westw. Natal.

Genus IMBRASIA, Hübn.

1. *I.* —, sp. n.? Sierra Leone.

I do not venture to describe a single specimen in bad condition, in the absence of any of the allied species to compare with it.

Genus UROTA, Westw.

1. *U. Sinope*, Westw. Natal?

A single specimen, erroneously labelled "Brazil."

Genus ANTHERÆA, Hübn.

1. *A. Suraka*, Boisd. Madagascar.

2. *A. Cytherea*, Fabr. Africa.

A pair in poor condition, without locality. This is known to be a very variable species, and the figures of Sulzer (*Bomb. Hesperus minor*, Gen. Ins. t. 21, f. 1) and Stoll (*Att. Capensis*, Pap. Ex. iv. t. 302 A, B, 325 G) are very dissimilar, the former agreeing most nearly with the Fabrician description. The figure in Hübner's Sammlung, vol. i., differs so much that I have ventured to describe it below as *A. Hübneri*, from the figure.

3. *A. Dione*, Fabr. Sierra Leone.

Petiver's figure (Gaz. t. 29, f. 3) probably represents this species, otherwise the typical West-African form has never been figured. The two following species have been considered to be varieties of *A. Dione;* but this appears

Digitized by Google

to me very doubtful; and I believe that observations on their transformations are about to be published which will establish them as distinct species.

4. *A. Wahlbergi*, Boisd. Natal.

5. *A. Gueinzii*, Staud. Natal.

Maassen and Weymer have lately figured this species as the true *Dione* in their Beiträge zur Schmetterlingskunde. The real *Dione* from West Africa is much more closely allied to *A. Wahlbergi*.

6. *A. Rhodophila*, Walk. Camaroons.

Genus ARGEINA, Wallengr.

1. *A. Mimosæ*, Boisd. Natal.

Unfortunately the larva which feeds on the *Mimosa*, and which was supposed to belong to this species, is, as I have been informed by Mr. H. C. Harford, of H. M.'s 77th Regiment, that of *Gynanisa Maia*. *Saturnia Campionea*, Sign., founded on the larva, likewise refers to the latter species.

Genus EUDÆMONIA, Hübn.

1. *E. Brachyura*. Dru. Sierra Leone.

Stoll's figure certainly represents this species, as is plain from the position of the spots; and the colouration of Drury's would lead to the same conclusion; but both figures are very bad. The Fabrician description (*Bombyx Argus*) appears to apply distinctly to this, and not to the following species.

2. *E. Argiphontes* (Maassen in litt.). Sierra Leone.

This species, described below, will be figured in the forthcoming Part IV of Maassen and Weymer's Beiträge zur Schmetterlingskunde.

Genus GYNANISA, Walk.

1. *G. Isis*, Westw. West Africa.

I am informed that this is the type specimen from which the figure in the Naturalist's Library was drawn.

Digitized by Google

2. *G. Maia*, Klug. Natal.

This species commonly stands in collections as *Isis*, Westw. Mr. Harford, who has bred them by hundreds, informs me that the larva feeds on the *Mimosa*, and that the perfect insect scarcely varies at all.

Genus SATURNIA, Schrank.

1. *S. Apollonia*, Cram. Natal.

Genus APHELIA, Hübn.

1. *A. Apollinaris*, Boisd. Natal.

Genus HENUCHA, Hübn.

1. *H. Delegorguei*, Boisd. Natal.

No attempt has been made in the present paper to rectify the position of the genera, although I have ventured to put the genera *Imbrasia* and *Urota* in juxtaposition, as I understand from Mr. Harford that the sexes present similar differences. I need scarcely add that the arrangement of the whole of the *Bombyces* is at present highly unsatisfactory, and greatly needs a thorough revision.

Bunæa Aslauga, n. sp.

♂. Exp. al. 7¼ in. Closely allied to *B. Alcinoe*, Stoll. Cramer's Pap. Ex. t. 322, f. A, B.

Hind margin of fore wings a little more concave. Reddish-brown; thorax and base of all the wings vinous and brown, bounded externally by a white sub-basal stripe. This stripe is better defined and nearly straight on the fore wings, which have also a very large vitreous spot on the disk, with a triangular notch on the outside. Costa broadly grey, commencing at the base, and broadening triangularly as far as the vitreous spot, which is placed on a broad, ill-defined stripe, rather darker than the ground colour. A submarginal dark stripe, edged on both sides with pinkish-white, nearly straight on the fore wings and curved on the hind wings, commences on the costa near the apex, where the paler colouring becomes suffused on both sides. Hind wings with the inner margin suffused

Digitized by Google

with reddish as far as the submarginal stripe. Ocellus orange, with a minute vitreous pupil, and with black and white outer rings, nearly as in *Alcinoe*, but placed about the middle of the wing, instead of close to the submarginal lines. Underside with the submarginal markings indicated; fore wings suffused with reddish, especially along costa, base, and inner margin. Ocellus of hind wings represented by a small, oval, vitreous spot, placed on the outside of a dark band. Body reddish; antennæ and tarsi black.

Hab.—Madagascar. One specimen in the Museum of the Royal Dublin Society.

Bunæa Thomsonii, n. sp.

♀. Expands nearly 8½ inches. Allied to *B. Angasana*, Westw., and *B. Phædusa*, Dru. Fore wings with the costa strongly arched, and the hind margin slightly convex; apex acute, but not so distinctly falcate as in *B. Angasana*. Fore wings brown, shaded with darker, and with grey; a small triangular vitreous spot on the disk; and a nearly straight dark line running from the tip towards the inner margin, where it becomes indistinct. Hind wings rather darker than the fore wings, the centre occupied by a large reddish space, on which is placed a slightly oval black eye of moderate size, surrounded by a red, and then by a pink ring; pupil vitreous, narrow, and very small.

Underside shaded with brown and grey, the dark line of fore wings present, and the vitreous spot more conspicuous, and with a brownish mark before and behind. Hind wings with a small brownish spot near the base, surrounded by a pinkish-white circle. The ocellus of the upperside is represented by four irregularly-shaped brownish spots, two large, and two small, on greyish ground, corresponding to the reddish portion of the wing above. The spots rest on a slightly curved band, which runs from the apex of the hind wing to the middle of the inner margin. A broad suffused band runs through the middle of all the wings. Body brown, a conspicuous white collar, as in *Phædusa*. Antennæ black.

Hab.—Cameroons. One specimen in the Museum of the Royal Dublin Society. Named after Mr. George Thomson, of Glasgow, the original discoverer of this and many other fine species.

Digitized by Google

Antheræa Hübneri, n. sp.

♀. Exp. al. 4¾ in. Allied to *A. Cytherea*, Fabr. Uniform ochre-brown, with two pale convergent stripes on each wing, the inner much less dentated than in *A. Cytherea*, and edged with dusky internally; the outer more distinctly edged with dusky externally. Ocelli slightly oval, and rather larger on the hind wings than on the fore wings; pupil white, surrounded with yellow, black and white rings. Underside with the eyes distinct, but rather smaller; the outer pale stripe broader, and the inner wanting; base of wings darker than above.

Figured in Hübner's Sammlung, vol. i., as "Echidna communi formis Cytherea."

Locality unknown.

The uniform colouration, the regularity and distinctness of the transverse lines on both wings, and the more basal position of the ocellus on the hind wings, which usually almost touches the outer line in *Cytherea*, will distinguish this insect from any specimen or figure of that species before me. The inner stripe is usually almost obsolete on the hind wings in *Cytherea*.

Eudæmonia Argiphontes (Maassen in litt.).

Exp. al. 3—3¼ in. Length of tail, 5¾ in. in ♂ and 2¾ in. in ♀. Allied to *Brachyura*, Dru. (*Argus*, Stoll); brown, ♀ paler; wings shaped as in *Brachyura*, and slightly scalloped, as in that species. A common dark stripe, edged externally with whitish (at least on the fore wings, where the costa is suffused with whitish between the stripe and the apex), extends from the costa of the fore wings to the inner margin of the hind wings, at about two-thirds of the length of the wings. Near the base of fore wings is a similar stripe, more oblique and diverging from the other, not reproduced below. Tails of the same shape as in *Brachyura*, and edged with darker, as are also the fringes of the wings. A narrow, pinkish line runs down the greater portion of the tail in the ♂; the tails in the ♀ are much more broadly edged with darker for two-thirds of their length. Near the outer stripe of the fore wings runs a row of four small vitreous spots, edged with yellow and black, within which are two smaller detached spots in the ♀ and one in the ♂. The vitreous spots are larger,

Digitized by Google

and the yellow edging less distinct in the ♀ than in the ♂. Hind wings with five similar but smaller spots within the stripe, placed irregularly. Underside similar but paler, basal stripe of fore wings absent. Body extending for half the length of the hind wings in ♂, and for three-quarters in ♀, tail not included. Antennæ with very distant pectinations.

Hab.—Sierra Leone; a single pair in the Museum of the Royal Dublin Society.

Digitized by Google

Digitized by Google

III. *Descriptions of new genera and species of Phytophagous Beetles belonging to the family* Cryptocephalidæ, *together with diagnoses and remarks on previously described genera.* By Joseph S. Baly, F.L.S., &c.

[Read 7th February, 1877.]

Family CRYPTOCEPHALIDÆ.

The tendency shown by some of our leading Entomologists to ignore small generic groups, and to regard them as mere sections of a larger and often unwieldy genus, is, I think, rather injurious than otherwise to the progress of Entomology. The time and labour necessarily consumed in wading through a long series of unnamed sub-sections (usually placed without any attempt at tabular arrangement), often deter students from working on those families in which these cumbrous genera exist.

The genus *Cryptocephalus* presents a striking case in point: containing upwards of 700 described species, held together by the slightest possible characters, it has been divided by Suffrian into numerous secondary groups, many of them so aberrant that it frequently becomes impossible to determine whether a species belongs to the genus or not.

Many of these groups having been previously characterized as distinct genera by Stål, Saunders, and other authors, I shall endeavour in the present paper to restore them to their original rank. In order to do this, it is necessary to divide Dr. Chapuis' sub-family *Cryptocephalites*, conjoined with a portion of his *Monachites* (viz., those genera in which the scutellum is well developed) into two primary groups, dependent on the form and emargination of the eyes.

In the first section, which includes *Cryptocephalus* proper, *Monachus*, and allied old world forms, the eyes are more or less elongate, frequently approximating or even contiguous in the ♂. They are broadly emarginate within, the canthus occupying to a great extent the inner border of the eye; its apex is very broadly rounded or

Digitized by Google

obtusely angled, and it rarely extends halfway across the transverse diameter of the eye; its sides are generally unequal, the lower edge being longer and more oblique than the upper one, the lower angle at the same time being either very broadly rounded or entirely obsolete; in addition, the antennæ (in the great majority of cases) are inserted at some little distance from the eye, a distinct space being left between the antennal cavity and its inner border.

In the second section the eye is shorter, more remote, more or less ovate, and more deeply and at the same time more narrowly notched. The canthus, which always extends halfway or even more across the eye, is either wedge-shaped or trigonate, its sides being nearly equal and its lower angle always distinct. The antennæ are always placed close to the lower angle of the canthus, the antennal cavity often encroaching on the surface of the notch itself.

This division includes *Ochrosopsis*, *Idiocephala*, *Cadmus*, and other allied Australian forms, a tabular arrangement of which I have placed below, giving afterwards diagnoses of those genera either re-established or characterized for the first time.

I. Scutellum subquadratum aut subtrigonatum.
- 1. Femora postica incrassata, ♂ .. .. .. *Lachnabothra.*
- 2. Femora postica non incrassata, ♂.
  - A. Thorax dorso valde gibbosus .. .. *Cyphodera.*
  - B. Thorax dorso bimamillatus .. .. *Brachycaulus.*
  - C. Thorax dorso convexus aut leviter gibbosus.
    - a. Thoracis margo lateralis denticulatus aut crenulatus.
      - b. Scutellum quadratum aut subquadratum, læve, dorso non carinatum .. .. *Cadmus.*
      - b¹. Scutellum subquadratum aut subtrigonatum, rugosum, dorso carinatum .. .. *Prionopleura.*
    - a¹. Thoracis margo lateralis integer, interdum leviter sinuatus.
      - c. Antennæ fusiformes .. .. *Aporocera.*
      - c¹. Antennæ articulis intermediis compressis et dilatatis, apice filiformes .. .. .. *Charideema.*
      - c¹¹. Antennæ ante medium filiformes.
        - d. Prosterni margo posticus angulatus.

Digitized by Google

e. Antennæ corpore æquilongæ aut longiores ♂, paullo breviores ♀ .. .. *Rhombosternus.*
e¹. Antennæ corpore breviores aut illo vix æquilongæ ♂, multo breviores ♀ .. *Loxopleurus.*
d¹. Prosterni margo posticus rotundatus, truncatus aut bilobatus.
f. Corpus oblongus aut elongatus, subcylindricus, elytrorum lateribus modice lobatis *Ochrosopsis.*
f¹. Corpus oblongo-quadratum aut subquadratum, elytrorum lateribus fortiter lobatis *Idiocephala.*
d¹¹. Prosterni margo posticus profunde incisus.. .. .. *Schizosternus.**
II. Scutellum lineariforme, apice libero, valde exserto *Dianchichus.*†

Genus CYPHODERA.

Cadmus, pars, Germ., Suffr., Chapuis.

Corpus oblongum, convexum, supra glabrum, subtus pube adpressâ subsquamiformi vestitum. *Caput* breve, ad marginem oculorum in thoracem insertum; *oculis* ovatis, intus triangulatim emarginatis; *antennis* filiformibus, corporis dimidio brevioribus, ♀ ‡, ad apicem leviter incrassatis. *Thorax* convexus, dorso gibbere valido, apice longitudinaliter compresso, instructus; margine basali regulariter denticulato, utrinque sinuato, medio late truncato, lateribus sinuatis, non denticulatis. *Scutellum* cuneiforme, læve, basi vix emarginatum, apice truncatum. *Elytra* thoracis basi paullo latiora, parallela, apice obtuse truncata, pygydium non obtegentia, lateribus ante medium sat valde lobatis; dorso convexa, circa scutellum abrupte elevata, confuse punctata, tuberculis validis, oblongis, lævibus nonnullis instructa. *Pedes* breves, robusti. *Prosternum* longitudine fere æquilatum, lateribus medio constrictis; margine antico paullo producto, deorsum vix deflexo;

* This genus, recently described by Dr. Chapuis, is unknown to me; but, judging from the brief characters given, it appears, without doubt, to belong to the present group.

† *Dianchichus* has a strongly serrulated hinder margin to the thorax, and, therefore, must be removed from the division in which Dr. Chapuis has placed it to the present one.

‡ In the only specimen of the ♂ sex that I possess, the antennæ are unfortunately broken, but, judging from the length of the remaining joints, they are probably as long as, or even longer than, the body.

Digitized by Google

margine postico obtuse truncato, medio obsolete sinuato; disco plano, pone medium concavo.

Type, *Cyphodera Chlamydiformis* (*Cadmus*), Germ.

Genus Brachycaulus, Fairm.

Ann. Ent. Soc. Fran. 1843, p. 14, tab. i. & ii. fig. 7—9.

Onchosoma, Saunders; *Cadmus*, pars, Suffrian, Chapuis.

Corpus oblongo-ovatum aut subquadrato-ovatum, convexum, pube squamiformi vestitum, supra rarius glabrum. *Caput* thoraci insertum; *oculis* ovalibus, intus profunde angulatim emarginatis; *antennis* filiformibus, corporis dimidio vix longioribus ♂, illo brevioribus ♀. *Thorax* convexus, dorso bimamillosus, lateribus denticulatis. *Scutellum* trigonatum, apice late truncatum. *Elytra* thoracis basi æquilata aut paullo latiora, valde convexa, pygydium amplectentia; rugosa, tuberculis et vittis nonnullis instructa; lateribus ante medium vix lobatis. *Pedes* robusti, *tarsis* latis, *unguiculis* basi incrassatis. *Prosternum* late oblongum, aut oblongum, margine postico obtuso aut bilobato; disco plano, interdum antice elevato, et ibi longitudinaliter excavato.

The species of *Brachycaulus* may be divided into two sections, dependent on the form of the hinder margin of the prosternum.

The double tuberosity of the upper surface of the thorax, combined with the short robust form, and the short antennæ in both sexes, will at once separate the *Brachycaulus* from any other genus having toothed lateral margins to the thorax.

Cadmus rugosus, foveicollis, dorsalis, Klugii and *Ewingii*, Saunders, as also *colossus*, Chapuis, belong to the present generic group.

Genus Cadmus, Erichs.

Wied. Archiv. viii. 1842, i. p. 119.

Cadmus, pars, Suffr., Chap.; *Odontocerus*, Saunders.

Corpus anguste oblongum, subcylindricum, subtus pube adpressâ squamiformi vestitum. *Caput* thoraci insertum; *oculis* ovalibus, intus profunde angulatim emarginatis; *antennis* filiformibus, ad apicem vix incrassatis, corpore longioribus ♂; illo æquilongis aut paullo brevioribus ♀. *Thorax* convexus, dorso non gibbosus, rugoso-punctatus,

Digitized by Google

lateribus denticulatis aut crenulatis. *Scutellum* quadratum aut subquadratum, latitudine plerumque paullo longior, basi bilobatum, disco lævi, non carinato. *Elytra* thoracis basi fere æquilata, circa scutellum abrupte elevata, glabra, confuse punctata; lateribus ante medium leviter aut modice lobatis, limbo inflexo pone medium attenuato, ante apicem desinente. *Pedes* robusti; *unguiculis* basi incrassatis.

Prosternum subquadrato-oblongum, postice ampliatum, margine postico obtuso aut obtuse rotundato; margine antico plerumque paullo deflexo.

Cadmus differs from *Prionopleura* in the glabrous upper surface of the body, in the smooth, non-carinate scutellum, in the much narrower, inflexed limb of the elytra, and in the rather more robust antennæ of the *male;* both genera agree in having the base of the pygydium covered to a greater or lesser extent by the apices of the elytra.

Cadmus australis, Boisd.; *litigiosus,* Boh.; *vibrans,* Suffr.; *excrementarius,* Suffr.; and *trispilus,* Chapuis, belong to this genus.

Genus Prionopleura, Saunders.

Trans. Ent. Soc. 1846, p. 197.

Corpus anguste oblongum aut elongatum, parallelum, subcylindricum, pube subsquamiformi vestitum. *Caput* in thoracem insertum, perpendiculare; *oculis* ovalibus, intus profunde, angulatim emarginatis; *antennis* filiformibus, interdum ad apicem leviter compressis et incrassatis, corpus plerumque longitudine superantibus ♂, corpore paullo brevioribus ♀. *Thorax* convexus, rugoso-punctatus, lateribus denticulatis. *Scutellum* basi emarginatum, subquadratum aut breviter trigonatum, apice late truncatum, dorso rugoso, carinato. *Elytra* rugoso-punctata, thoracis basi æquilata, oblonga, pygydium plus minusve obtegentia, lateribus basi modice lobatis, limbo inflexo ad apicem distincto. *Pedes* robusti; *unguiculis* basi incrassatis. *Prosternum* late oblongum aut oblongum, margine antico deflexo, margine postico obtuso aut obtuse rotundato.

C. crucicollis, Boisd.; *rugicollis,* Gray; *cognatus, bifasciatus, flavicinctus* and *histrionicus,* Suffr., together with *purpurascens,* Chapuis, form this generic group. I also possess several undescribed species in my collection.

Digitized by Google

Genus APOROCERA, Saunders.

Proc. Ent. Soc. 1843, p. 54.

Corpus elongatum, parallelum, subcylindricum. *Caput* thoraci insertum; *oculis* magnis, paullo prominulis, ovalibus, intus profunde angulatim emarginatis; *antennis* robustis, fusiformibus, articulis primo ovato, secundo brevi, his glabris, nitidis; cæteris incrassatis, dense hirsutis. *Thorax* convexus, dorso leviter gibbosus; lateribus integris, late marginatis, margine postico utrinque obliquo, lobo basali truncato. *Scutellum* trigonatum, apice truncatum. *Elytra* thorace æquilata, lateribus ante medium valde lobatis; dorso circa scutellum abrupte elevata, striatim punctata. *Pedes* robusti, mediocres; *unguiculis* basi incrassatis. *Prosternum* planum, margine antico deflexo; margine postico truncato.

Type, *Aporocera apicalis*, Saunders.

The specimen of *A. apicalis*, from which I have drawn up the above characters, is a ♀; Mr. Saunders' type specimen, now in the Hopeian cabinet, has been kindly examined for me by Professor Westwood, who finds that it also belongs to the same sex. The types of *A. bicolor* and *chalybea*, both described from Mr. Hope's collection, are now unfortunately missing; but judging from the figure and descriptions given by Saunders, they are very nearly allied to *A. apicalis*, and belong, without doubt, to the same generic group. The fourth species, *A. Cato-xantha*, Saunders, is an *Idiocephala*.

Genus CHARIDERMA.

Corpus oblongo-elongatum, subcylindricum. *Caput* thoraci insertum; *oculis* ovalibus, intus profunde angulatim emarginatis; *antennis* ad oculos proxime insertis, corpore æquilongis, articulis 3tio ad 6tum compressis et dilatatis, 7to compresso, minus dilatato, quatuor ultimis cylindricis, non dilatatis. *Thorax* convexus, lateribus integris, ante apicem sinuatis. *Scutellum* trigonatum, apice elevato, truncato, basi bilobatum. *Elytra* thoracis basi paullo latiora, parallela, lateribus ante medium modice lobatis; supra convexa, circa scutellum modice elevata, punctato-striata. *Pedes* modice elongati, *unguiculis* basi incrassatis. *Prosternum* transverso-quadratum, postice

Digitized by Google

paullo ampliatum, margine antico paullo producto, oblique deflexo, margine postico bilobato.

The type of this new genus is a ♀, the ♂ being unknown to me, but the dilatation of the intermediate joints of the antennæ (so unusual in the female sex) justifies, in my opinion, its separation from *Idiocephala*, and its erection into a distinct generic form.

Chariderma pulchella.

Oblongo-elongata, læte fulva, nitida, antennis (annulo albido ante apicem excepto), pectore lateribus et postice, abdomine, tibiis tarsisque nigris; thorace convexo, utrinque oblique sulcato et pone sulcum leviter elevato, fere impunctato, vittâ mediali et utrinque maculâ rotundatâ prope marginem positâ nigris; scutello basi nigro-marginato; elytris punctato-striatis, utrisque maculâ oblongâ, supra callum humerale positâ, nigrâ, instructis.

Long. 4½ lin.

Hab.—Western Australia.

Face excavated between the eyes; vertex finely rugose-punctate; clypeus trigonate; antennæ equal to the body in length, black, the eighth and the ninth joints (the apex of the latter excepted) yellowish-white; the basal one incrassate, subclavate, the second short, the third to the sixth joints compressed and dilated; the third elongate, gradually increasing in width on either side nearly to the apex; the fourth and fifth equal in length, narrowed at the base, each shorter than the third, the sixth still shorter, less broadly dilated; the seventh two-thirds the length of the preceding joint, only moderately thickened and compressed; four following joints cylindrical, nearly equal in length, each shorter than the seventh. Thorax twice as broad at the base as long; sides slightly diverging at the extreme base, thence obliquely converging to the apex, lateral margin entire, sinuate before the middle; upper surface transversely convex, obliquely impressed on either side behind the middle, the space behind the sulcate portion thickened. Scutellum wedge-shaped, its apex truncate, its base bilobate and overlapping the basal lobe of the thorax; the basal border narrowly edged with black. Elytra slightly broader than the thorax, punctate-striate, the interspaces smooth, impunctate.

Digitized by Google

Genus Ochrosopsis, Saunders.

Proc. Ent. Soc. Lond. 1842, p. 56.

Chloroplisma, Dicenopsis, Idiocephala, pars, Saunders; *Cryptocephalus,* pars, Suffrian.

Corpus oblongum, anguste oblongum aut elongatum, subcylindricum. *Caput* thoraci insertum, perpendiculare; *oculis* ovalibus, intùs profunde angulatim emarginatis; *antennis* filiformibus, articulis exterioribus sæpe leviter compressis et dilatatis, rarius abrupte incrassatis ♂. *Thorax* convexus, lateribus integris. *Scutellum* subquadratum aut subtrigonatum, apice late truncato. *Elytra* thoracis basi fere æquilata, circa scutellum abrupte incrassata, lateribus ante medium modice lobatis. *Pedes* mediocres, *unguiculis* basi incrassatis. *Prosternum* elongatum, oblongum aut subquadratum, margine antico plerumque deflexo; margine postico bilobato aut sinuato, interdum obtuse truncato aut rotundato.

This genus includes many of the species described by Saunders under *Idiocephala,* also (at any rate for the present) his genus *Mitocera. Mitocera viridipennis,* Saunders, recently redescribed by Dr. Chapuis under the name of *Crypt. perlongus,* differs from the majority of the species chiefly in the slender antennæ, longer than the body in either sex, in the elongate prosternum, rounded at its hinder apex, and combined with these in its narrow elongate body.

Ochrosopsis erudita.

Elongata, subcylindrica, læte rufo-fulva, nitida, vertice, antennis, scutello, tibiis apice tarsisque nigris; thorace utrinque pone medium oblique impresso, rude punctato; elytris metallico-viridibus, profunde substriatim punctatis, utrisque vittâ obliquâ, prope medium positâ et ad suturam confluentâ, conjunctis literam V simulantibus, rufo-fulvâ ornatis.

Long. 3 lin.

Hab.—South Australia.

Head rugose-punctate, excavated between the eyes; vertex, canthi and antennæ black; these latter with the third joint slender, elongate, the fourth two-thirds the length of the third, the fifth nearly equal to the third, slightly thickened, sixth and seventh compressed and dilated (the others are broken off). Thorax twice as broad

Digitized by Google

at the base as long, sides nearly straight, and parallel from the base nearly to the middle, thence obliquely converging to the apex; above convex, coarsely but not closely punctured, obliquely excavated on either side behind the middle, the puncturing finer on the centre of the disk. Scutellum subquadrate, its basal margin bilobate. Elytra not broader than the base of the thorax; sides parallel, moderately lobed before the middle; upper surface coarsely and deeply punctured; interspaces thickened, transversely elevate-reticulate; near the apex, close to the suture, are several short, raised vittæ. Prosternum rather longer than broad, its apical border produced, deflexed, thickened on either side, and separated from the anterior episternum by a deep notch; hinder margin obtusely bilobed.

Genus Idiocephala, Saunders.

Trans. Ent. Soc. 1845, p. 142, pars; *Aporocera*, pars.

Corpus anguste subquadrato-oblongum, valde convexum. *Caput* in thoracem insertum; *oculis* ovalibus, intus triangulariter emarginatis; *antennis* corpore longioribus ♂, articulis 5to ad 11um sæpe compressis et modice incrassatis; *antennis* corpore brevioribus ♀, articulis sex ultimis plus minusve compressis et dilatatis. *Thorax* convexus, dorso subgibbosus, lateribus marginatis, margine postico utrinque sinuato, lobo basali truncato. *Scutellum* trigonatum. *Elytra* basi thoracis æquilata, pone medium sæpe constricta, lobis epipleuralibus valde productis. *Pedes* graciles, modice elongati, simplices; *unguiculis* basi incrassatis. *Prosternum* planum aut leviter concavum, margine antico deflexo, margine postico obtuse truncato, interdum leviter sinuato.

This genus is formed on a group of species peculiar to Australia, of which *S. speciosa*, Boisduval, and *catoxantha*, Saunders, may be considered as types; the latter species, as before stated, was placed by Mr. Saunders (although with doubt) in *Aporocera*. *C. chrysomelinus*, *condensatus*, *fraternalis*, *gracilis* and *eumolpus*, insects recently described by Dr. Chapuis, also belong to the same generic group. *Idiocephala flaviventris* and *rugosa*, Saunders, also enter into it. The peculiar constriction of the hinder half of the elytra, exposing in many species the sides of the upper surface of the abdomen, together with the strongly produced epipleural lobes, at once distinguish *Idiocephala* from *Ochrosopsis*.

Digitized by Google

Genus Mylassa, Stål.

Ofvers. Vet. Ak. Förh. 1857, p. 60; *Cryptocephalus*, pars, Suffr.

Corpus oblongum aut elongato-oblongum, parallelum, convexum, pube tenui vestitum. *Caput* thoraci insertum; *oculis* ovatis, intus vix sinuatis; *antennis* filiformibus, articulis quatuor ultimis ♂ interdum dilatatis. *Thorax* convexus, margine postico non serrulato, medio in lobum validum, apice crassum, liberum, scutelli basin obtegente, retrorsum producto. *Scutellum* subcordatum aut trigonatum, apice acutum. *Elytra* thoraci æquilata, punctato-striata, lobis epipleuralibus modice productis. *Pedes* robusti, antici ♂ modice elongati; *femoribus* (præsertim *maris*) incrassatis; *tibiis* anticis *maris* sæpe apice incurvatis et incrassatis; *unguiculis* basi incrassatis. *Prosternum* plerumque concavum, margine antico plerumque leviter deflexo, margine postico obtuso aut obtuse angulato, medio rarius obsolete sinuato; lateribus *maris* sæpe spinâ acutâ armatis.

This remarkable form, characterized by Dr. Stål in the year 1857, was subsequently merged by Suffrian into *Cryptocephalus*. The absence of teeth on the hinder margin of the thorax (a character made use of by Dr. Chapuis to divide the family into sections) requires its removal from the position which Suffrian has assigned to it, and, taken in conjunction with the raised thickened apex of the basal thoracic lobe, the nearly entire eyes, and the pubescence of the upper surface of the body, fully justifies its re-establishment as a genus.

Genus Stegnocephala.

Corpus breviter oblongum, postice paullo attenuatum, valde convexum. *Caput* in thoracem insertum; *oculis* magnis, elongatis, apice plus minusve approximantibus, intus late emarginatis; *antennis* dimidio corporis fere æqualibus, interdum paullo brevioribus, articulis ultimis septem, aut rarius articulis ultimis sex paullo compressis et dilatatis. Thorax transversus, convexus, apice subcylindricus, margine basali utrinque sinuato, angulis posticis retrorsum productis, acutis; lobo basali brevi, vix producto, late truncato, bis-emarginato. *Scutellum* trigonatum. *Elytra* basi thoracis æquilata, postice paullo attenuata; dorso convexa, circa scutellum elevata, punctato-striata;

Digitized by Google

limbo inflexo ante medium dilatato, lobum distinctum formante. *Pedes* breves, robusti; *coxis* posticis distantibus; *unguiculis* basi incrassatis. *Prosternum* transversum, antice transversim convexum, margine antico antrorsum producto, interdum oblique deflexo; margine postico leviter concavo-emarginato, angulis posticis paullo productis, acutis; *mesosternum* breve, prosterno æquilatum, margine postico bisinuato.

I have established the above generic group for the reception of *C. hemixanthus* and other species of similar habit included by Dr. Suffrian in *Cryptocephalus*, and placed by him, in his Monograph of the South American species, in the third section of that genus. *Stegnocephala* presents a remarkable similarity to *Monachus*, from which genus it is separated by the produced anterior border of the prosternum, as well as by the larger size, larger eyes, often contiguous at the apices in the ♂, and by the longer antennæ; from *Cryptocephalus* it is distinguished by the broad, very convex, *Monachus*-like form, the widely separated hinder coxæ and the strongly lobed* sides of the elytra; also by the short, very transverse mesosternum, the apex of which is bisinuate; the antennæ are shorter, their six or seven outer joints being usually thickened, and forming a slender club. *Cryptocephalus turgidus*, Suffrian, does not belong to the present genus.

Genus Nyetra.

Corpus oblongum, subcylindricum, pube adpressâ dense vestitum. *Caput* thoraci insertum, perpendiculare; *oculis* parvis, remotis, subrotundatis, integris; *mandibulis* ♂ elongatis, basi intus lobatis, apice curvatis; *mandibulis* ♀ non elongatis; *clypeo* ♂ antice in lobum oblongum producto; *clypeo* ♀ antice emarginato, non producto; *antennis* corporis dimidio multo brevioribus, gracilibus; articulis primo elongato, paullo incrassato, secundo brevi, tertio ad sextum gracilibus, fere filiformibus, quinque ultimis leviter incrassatis. *Thorax* elytris æquilatus, basi utrinque bisinuatus, lobo basali producto, apice emarginato. *Scutellum*

* The lateral lobes on the anterior half of the elytra are formed in the present genus by the dilatation of the inflexed limb; in *Idiocephala*, *Aporocera*, &c., they are formed principally by an extension of the upper surface of the elytra.

Digitized by Google

parvum, apice non elevato. *Elytra* striatim punctata. *Pedes* robusti, breves; *unguiculis* appendiculatis. *Prosternum* planum, latitudine fere duplo longior ♂; latitudini æquilongum ♀; apice postico in utroque sexu concavo-emarginato, angulis posticis acutis.

This singular genus, remarkable for the prolongation of the parts of the mouth and of the lower portion of the face in the ♂, recalls to mind the males of some species of *Clythridæ*. *Nyetra* may be known from *Scaphodius* by the concave hinder margin of the prosternum; from *Elaphodes*, by the more rotundate, entire eyes.

Nyetra forcipata.

Breviter oblonga, subcylindrica, picea, sat dense griseo-sericea, antennis extrorsum nigris; thorace crebre punctato; elytris punctato-striatis, interstitiis crebre punctatis.

Mas.—*Clypeo* antrorsum in lobum oblongum producto; *mandibulis* elongatis, forcipatis, basi intus lobatis.

Fœm.—*Clypeo* antrorsum non producto; *mandibulis* non elongatis.

Long. 2 lin.

Hab.—New Caledonia.

Head rather coarsely punctured; eyes rotundate, entire; antennæ slender, equal to half the length of the body in the ♂, rather shorter in the ♀; basal joint elongate, slightly thickened, extending to the outer margin of the eye in the ♂, shorter in the ♀; second ovate, following three subfiliform, each about one-half longer than the second, six outer joints slightly thickened and compressed. Thorax nearly twice as broad as long at the base; sides entire, obtusely rounded in the ♂, rounded and converging from base to apex in the ♀; hinder margin bisinuate on either side, basal lobe produced, angulate, its apex broadly notched to receive the base of the scutellum; above convex, rather strongly and closely punctured. Scutellum small, ovate. Elytra not broader than the thorax, slightly attenuated towards the apex, the latter partially covering the pygydium, the sides before the middle only moderately lobed; above convex, punctate-striate, and the interspaces closely punctured; callus scarcely thickened. Anterior pair of legs in the male slightly more elongate and more robust than the other pairs.

Digitized by Google

Genus PRASONOTUS, Suffrian.

Prasonotus ruficaudis.

Late oblongus, parallelus, subcylindricus, nitidus, subtus niger, abdominis apice pedibusque rufis; supra obscure metallico-cyaneus, viridi-micans, antennis rufo-fulvis, apice nigris.

Long. 2½ lin.

Hab.—New South Wales.

Head subopaque, vertex rather closely impressed with distinct, oblong punctures; in the middle is a longitudinal depression. Clypeus coarsely punctured; labrum pale fulvous; jaws black, three outer joints of antennæ also black. Thorax twice as broad as long at the base; sides rather broadly margined, rounded and converging from base to apex, sinuate behind the middle, the hinder angles very acute; upper surface finely but not closely punctured, the interspaces smooth. Elytra regularly punctate-striate; interspaces remotely impressed with fine punctures.

Prasonotus morbillosus.

Oblongus, parallelus, subcylindricus, niger, nitidus, cæruleo vix micans; capite thoraceque subnitidis, sordide rufis, hoc crebre punctato; antennis extrorsum piceis; elytris metallico-cæruleis, viridi-micantibus, rude punctatis, punctis in medio confuse dispositis et interspatiis rugoso-elevatis; punctis prope suturam et ad latera striatim dispositis, interspatiis subcostatis.

Var. A. Capite thoraceque nigris.

Long. 2½ lin.

Hab.—New South Wales; Western Australia.

Head closely punctured, impressed on the vertex and front with a shallow, longitudinal groove, the surface on either side being slightly thickened; anterior border of clypeus slightly sinuate; labrum fulvous; eyes and jaws black. Thorax with its sides rounded and converging from base to apex, narrowly margined; upper surface convex, closely and coarsely punctured, with the exception of the space in front of the basal lobe, which is smooth and nearly impunctate; interspaces, except on the basal lobe, thickened and forming irregular, longitudinal strigæ; hinder margin of thorax narrowly edged with black. Elytra not broader than the thorax, rather strongly lobed at the base; strongly punctured, the puncturing arranged

Digitized by Google

in regular striæ near the suture, near the outer margin, and at the apex; on the anterior two-thirds of the middle disk they are arranged irregularly, their interspaces being elevate-rugose; those between the striæ being subcostate.

The broader form, together with the coarser punctuation of the whole surface, and also the irregular arrangement of the punctures on the middle disk of the elytra, will at once separate this species from *P. submetallescens*.

Genus DIORYCTUS, Suffrian.

Dioryctus Mouhoti.

Subrotundatus, valde convexus, castaneus, nitidus, subtus (pectore excepto) fulvo-piceus, antennis extrorsum piceis; thorace lævi; elytris punctato-striatis, interspatiis lævibus.

Long. 2 lin.

Hab.—Mountains of Laos, Siam.

Lower portion of face finely and closely punctured, vertex smooth, impunctate; seven outer joints of antennæ piceous, the four lower ones fulvous; labrum pale fulvous; jaws black. Thorax smooth and shining, faintly impressed with remote punctures, visible only under a deep lens. Elytra regularly punctate-striate, the interspaces smooth, impunctate.

Nearly allied to *D. grandis*, but it is more rotundate and only one-third the size. *D. Lewisii*, described by me in my paper on Japanese *Phytophaga*, belongs to Dr. Chapuis' genus *Atropidius*.

Digitized by Google

IV. *Descriptions of new species of Phytophagous Beetles belonging to the family* Eumolpidæ; *and a Monograph of the genus* Eumolpus. By Joseph S. Baly, F.L.S., &c.

[Read 7th February, 1877.]

Genus Colaspis, Fabr.

Colaspis Lefèvrei.

Elongata, convexa, purpureo-metallica, sæpe æneo-tincta, subnitida, subtus nitida, supra sat crebre punctata; thoracis lateribus tridentatis; antennis extrorsum nigris, pedibus metallico-viridibus.

Var. B. Corpore toto viridi-metallico.

Long. 5—6 lin.

Hab.—Banks of the Amazon, collected by Mr. Bates.

Vertex rather strongly but not closely punctured, front impressed with a longitudinal groove; clypeus subtrigonate, more closely and finely punctured than the front; lower portion of face metallic green, with a brassy reflection, labrum and palpi pale fulvous; eyes oval, slightly sinuate within; antennæ filiform, nearly equal to the body in the ♂, rather shorter in the ♀; basal joint thickened, ovate, and, together with the fourth, metallic green, second and third, together with the apex of the first, obscure fulvous, stained with metallic green; four or five outer joints black; all the joints from the third to the apical one nearly equal in length, compressed but not dilated. Thorax nearly twice as broad as long, sides rounded, the apical angle acute, curved slightly outwards, lateral margin tridenticulate. Scutellum metallic green, semioblong-ovate, its apex acute, its disk smooth, impunctate. Elytra broader than the thorax, oblong; sides parallel, their apices subacutely rounded; above convex, scarcely excavated below the basilar space; surface covered, as well as that of the thorax, with coarse round punctures; interspaces towards the apex irregularly thickened. Basal joint of anterior tarsus dilated in the male, oblong-ovate.

Digitized by Google

Genus NODOSTOMA, Motsch.

Nodostoma magnificum.

Oblongo-ovatum, convexum, cæruleo-metallicum, viridi-tinctum, supra cupreo-aureum; antennis nigris, basi cæruleis; thorace subcrebre punctato; elytris regulariter punctato-striatis, striis sulcatis, interspatiis sub lente minute punctatis, convexis, ad latera costatis, limbo inflexo viridi-metallico.

Long. 6 lin.

Hab.—Madagascar; in my own cabinet, and also in the British Museum collection.

Head rather closely punctured; clypeus brassy green, transverse, its apical border truncate, not distinctly separated from the face, its anterior margin concave-emarginate; upper face impressed between the eyes with an oblong fovea; labrum and jaws black; antennæ half the length of the body, five lower joints metallic blue, the rest black, densely clothed with short velvety hairs. Thorax nearly twice as broad at the base as long; sides straight and only very slightly converging at the base, rounded and converging in front; all the angles armed with a subacute tooth. Scutellum semioblong-ovate, its surface concave, impressed with a few scattered punctures. Elytra broader than the thorax, their sides parallel, the apex regularly rounded; above convex, not excavated below the basilar space, the humeral callus moderately prominent. Four anterior thighs armed beneath with a small tooth, the hinder pair unarmed; apices of anterior tibiæ thickened and slightly recurved.

Nodostoma tricolor.

Late ovatum, valde convexum, viridi-æneum, nitidum, antennis (basi fulvâ exceptâ) nigris; subtus nigrum, thoracis lateribus pectoreque obscure viridi-metallicis; femoribus (basi et apice exceptis) rufis; thorace subremote punctato, lateribus pone medium angulatis, dente brevi armatis; elytris regulariter punctato-striatis, interstitiis planis.

Var. B. Corpore supra purpureo, cæteris ut in typo.

Long. 2½—3 lin.

Hab.—Siam Var. B. *Pachybouri*; collected by the late M. Mouhot.

Digitized by Google

Head coarsely but not very closely punctured, vertex and front rugulose; clypeus wedge-shaped, its apical margin obsolete, its anterior margin concave-emarginate, edged with black, cheeks and jaws also black; four lower joints of antennæ, together with the palpi, fulvous. Thorax twice as broad as long; sides angulate a short distance in front of the base and armed with a short acute tooth; thence obliquely converging and rounded to the apex, all the angles furnished with an obtuse tubercle; disk moderately convex, subremotely punctured; anterior margin thickened, smooth and shining, bordered within by a single row of punctures. Scutellum wedge-shaped, its apex obtusely angulate. Elytra much broader at the base than the thorax; sides converging from the base towards the apex, the latter rounded; above very convex, excavated below the basilar space, the latter thickened, the humeral callus very prominent; surface punctate-striate, the punctures much finer towards the apex; interspaces smooth, impunctate. Thighs each armed beneath with a small spine.

Nodostoma Dormeri.

Breviter oblongo-ovatum, convexum, sordide rufum, subnitidum, antennis (basi exceptâ), mandibulis, tibiis tarsisque nigris; capite thoraceque crebre punctatis; elytris læte viridi-metallicis, nitidis, punctato-striatis, striis ad apicem fere deletis; utrisque intra marginem vittâ elevatâ, basi sinuatâ; callo humerali valde elevato.

Long. 3 lin.

Hab.—India; collected by Lord Dormer.

Head coarsely and closely punctured, rugose-punctate on the clypeus, the latter not separated from the upper face; four lower joints of antennæ rufous, the rest black. Thorax nearly twice as broad as long; sides very obtusely angled behind the middle; angles acute; surface coarsely punctured, a narrow space along the middle of the apical border slightly thickened, smooth and shining, impunctate. Scutellum bluish-black. Elytra broadly oblong, each transversely excavated below the basilar space, the humeral callus strongly raised; surface distinctly punctate-striate, the puncturing much finer below the middle and nearly obsolete at the apex; on each elytron near the outer border is a coarse longitudinal costa, which, commencing at the lower end of the humeral callus, extends downwards

Digitized by Google

as far as the commencement of the apical third of the elytron; the anterior half of the costa is flexuose. Thighs thickened, subampulate, hinder pair armed beneath with a small tooth; extreme bases of all the tibiæ piceous.

Nodostoma Bevani.

Breviter ovatum, valde convexum, nitidum, subtus obscure viridi-æneum, supra aureum, antennis (basi fulvâ exceptâ) nigris; capite thoraceque subcrebre punctatis; elytris anguste viridi-metallico-limbatis, infra basin vix transversim depressis, distincte punctato-striatis, striis ad apicem distinctis; callo humerali prominenti.

Long. $2\frac{1}{2}$ lin.

Hab.—Southern India; collected by Lieutenant Bevan.

Clypeus not separated from the face, its anterior border angulate-emarginate; front impressed with a shallow fovea; four lower joints of antennæ fulvous, the rest black. Thorax nearly twice as broad as long, sides rounded and converging from base to apex, all the angles acute; surface rather more coarsely punctured than the head. Scutellum broader than long, smooth, metallic green. Elytra broader than the thorax at the base; sides converging towards the apex, the latter broadly rounded; surface faintly impressed below the basilar space, the humeral callus prominent; the punctate striæ distinct for their whole length, but less deeply impressed towards the apex. Thighs ampulate, hinder pair armed beneath with a minute tooth.

Genus RHYPARIDA, Baly.*

Rhyparida formosa.

Anguste oblongo-ovata, convexa, rufo-testacea, nitida, antennis (basi exceptâ) tarsisque nigris; elytris viridi-

* Dr. Chapuis, in re-establishing *Pyropida*, merged by me into *Rhyparida*, and in combining this latter genus with *Metachroma*, has made a singular error. He says, that in *Metachroma* (including *Rhyparida*) the second and third joints of the antennæ are nearly equal in length, whilst in *Pyropida* (which he restores to generic rank) the second joint is one-half shorter than the third. This is strictly true, when applied to the species of *Metachroma* proper, but in *Rhyparida*, of which genus I possess a very long series of species, the second joint is always short, and scarcely ever exceeds half the length of the third.

Digitized by Google

metallicis, regulariter punctato-striatis, striis ad apicem minus fortiter punctatis.

Long. 3 lin.

Hab.—New Hebrides.

Head smooth, remotely punctured; clypeus semiovate, its apical border obsolete; three lower joints of antennæ rufo-fulvous, the rest black; jaws nigro-piceous. Thorax not broader than long; sides regularly rounded, converging at base and apex, all the angles acute; disk remotely punctured. Elytra much broader than the thorax, oblong, sides parallel, apex subacutely rounded; above convex, not excavated below the basilar space, the humeral callus moderately prominent; surface distinctly punctate-striate, the striæ less strongly impressed on the hinder disk; interspaces plane, impunctate.

Rhyparida Howitii.

Anguste oblongo-ovata, sordide rufa, subnitida, subtus nitida, genubus, tibiis apice, tarsis, pectore abdomineque piceis; antennis (basi exceptâ) nigris; elytris punctato-striatis, viridi-metallicis.

Long. 3 lin.

Hab.—Australia.

Head minutely granulose; clypeus not distinctly separated from the face, its apex rounded, its anterior border edged with piceous, deeply notched; surface distinctly but not closely punctured; vertex very minutely punctured, the punctures remote; upper face impressed with a longitudinal sulcation, which extends upwards from the apex of the clypeus; apices of jaws black; four lower joints of antennæ rufo-fulvous, the rest black. Thorax twice as broad as long, sides nearly parallel at the base, thence rounded and converging to the apex, all the angles acute; above moderately convex, minutely granulose, impressed with very fine, scattered punctures, only visible under a lens. Elytra oblong, their sides parallel, their apices regularly rounded; above convex, faintly excavated below the basilar space, the humeral callus moderately prominent; surface strongly punctate-striate, less strongly impressed posteriorly; interspaces plane, faintly convex near the apex.

The different form of the thorax will at once separate the present from the preceding species.

Digitized by Google

Genus SCELODONTA, Westwood.

Scelodonta albidovittata.

Ovata, valde convexa, rufo-cuprea, nitida, subtus (pedibus exceptis) cuprea, abdominis vittis duabus, thorace epipleurisque dense albido-pilosis; thorace transversim irregulariter elevato-strigoso, vittis tribus è pilis adpressis albidis ornato; elytris convexis, rude striatim punctatis, spatio infra scutellum excavato, confuse punctato; interspatiis elevatis, ad apicem costatis, basi irregulariter elevato-reticulatis; utrisque vittis (circa 5) è pilis adpressis albidis porrectis instructis.

Long. 2¼ lin.

Hab.—South Africa, Damara Land.

Head sparingly clothed with white adpressed hairs; vertex coarsely rugose, lower face and clypeus coarsely but not closely punctured, the latter narrowly wedge-shaped, its apex obsolete, its anterior border tri-emarginate, the centre notch angular, finely denticulate; surface plane, deeply excavated in front; labrum and jaws black; palpi æneous; antennæ with the two lower joints cupreous, the following three æneous, the rest black. Thorax about one-third broader than long, subcylindrical, flattened above, longitudinally excavated along the median line; sides rounded and diverging from the base to behind the middle, thence obliquely converging and slightly rounded towards the apex, the apex itself more quickly rounded; above closely covered with coarse, transverse, irregularly anastomosing raised strigæ; general surface sparingly clothed with fine, adpressed, white hairs; on the disk are three longitudinal rows of coarser adpressed hairs. Scutellum not longer than broad, pentangular, the three upper angles slightly produced, acute. Elytra broadly oblong, slightly narrowed towards the apex, the latter rounded; above convex, humeral callus prominent, obtuse; surface coarsely punctate-striate, the interspaces thickened, costate on the sides and apex; just below the scutellum is a small, excavated, irregularly punctured space; on each elytron are four or five longitudinal rows, formed of adpressed, white hairs, the second and third rows from the suture confluent at the apex. Thighs each armed beneath with an acute spine; apices of four hinder tibiæ only slightly emarginate. The thorax beneath, the sides of the pectus and two longitudinal rows on the abdomen densely clothed with adpressed hairs, rest of the surface only sparingly pubescent.

Digitized by Google

Scelodonta bidentata.

Ovata, valde convexa, viridi-metallica, nitida, supra minus nitida, capite pedibusque cupreis, femoribus viridi-tinctis, subtus dente parvo armatis; antennis extrorsum nigris; thorace cupreo-tincto, rude punctato, interstitiis disci transversim elevato-reticulatis; elytris rude rugoso-punctatis, interspatiis longitudinaliter costatis, costis cupreo-tinctis; utrisque elytris callo humerali plagâque trigonatâ male definitâ, prope medium positâ, a margine exteriori fere ad suturam extensâ, obscure cupreis.

Long. 4 lin.

Hab.—Old Calabar.

Whole upper surface of body granulose. Head rugose, front impressed with a longitudinal groove; lower portion of face coppery red; eyes very prominent; clypeus campanulate, its anterior margin produced into two stout acute teeth, the apices of which are black; antennæ with the six outer joints thickened and compressed, black; five lower joints obscure cupreous. Thorax transverse, its sides regularly rounded; anterior margin narrowly edged with rufo-cupreous. Scutellum slightly broader than long, pentangular, its apical angle obtuse. Elytra much broader at the base than the thorax, broadly oblong, narrowed towards the apex, the latter subacutely rounded; upper surface sparingly clothed at the sides with very short hairs.

The only two specimens that I have seen of this insect have apparently been much dulled by long immersion in spirits.

Genus Pseudocolaspis, Laporte.

Pseudocolaspis rigida.

Ovata, valde convexa, cuprea, nitida, sparse albido-setosa, pedibus obscure nigro-cupreis; antennis brevibus, ad apicem incrassatis, nigris; thorace ovali-globoso, rugoso, crebre et rude punctato, setulis brevibus erectis vestito; elytris thorace latioribus, setis albidis suberectis rigidis vestitis, subcordatis, convexis, infra basin vix depressis, fortiter striatim punctatis, callo humerali valde prominenti; femoribus subtus spinâ acutâ armatis.

Long. 1½ lin.

Hab.—Guinea (Camaroons).

Head granulose, covered with irregular longitudinal

Digitized by Google

strigæ, interspaces between the strigæ sparingly punctured; antennæ equal in length to the head and thorax, five upper joints thickened, the sixth obconic, the following three turbinate, the apical joint ovate, its apex acute; basal joint cupreous, the following three obscure piceous, the rest black. Thorax longer than broad, sparingly clothed with short, erect, rigid hairs, globose-ovate, sides slightly converging in front; upper surface transversely depressed below the apex, closely covered with large deep punctures, their interstices irregularly thickened. Scutellum oblong-quadrate, its apex concave, the apical angles slightly produced, acute. Elytra much broader than the thorax, subcordate; above convex, transversely depressed below the base, humeral callus strongly elevated, compressed; surface clothed with rigid white hairs, which are rather more scattered, longer and rather less erect than those on the thorax; strongly punctate-striate, the puncturing finer towards the apex, interspaces smooth and shining, faintly rugulose on the basal depression, slightly convex towards the apex; on the basal half of the outer disk, below the shoulder and on the outer margin, the interspaces are more distinctly thickened. Body beneath clothed with white hairs, those on the coarsely punctured breast, long, depressed. Abdomen smooth and shining, remotely punctured, its pubescence very short, scattered and suberect.

Pseudocolaspis eximia.

Ovata, valde convexa, late cuprea, nitida, pube albidâ vestita, supra viridi-metallica; antennis basi cupreis, extrorsum nigris; thorace rude punctato, interstitiis transversim elevato-reticulatis; elytris limbo exteriori cupreo, rude punctatis, punctis basi confuse, ad apicem striatim dispositis, interspatiis apicem versus convexis, subcostatis; femoribus subtus bispinosis.

Long. 2½ lin.

Hab.—West Coast of Africa.

Head rugose, very sparingly clothed with fine suberect hairs; clypeus not separated from the face; antennæ rather longer than the head and thorax, six basal joints cupreous, the rest thickened, black. Thorax about one-fourth broader than long, sides rounded, converging in front; above subcylindrical, flattened on the disk, coarsely punctured, interstices transversely elevate-reticulate; sur-

Digitized by Google

face sparingly clothed with suberect pubescence. Scutellum semirotundate, sides thickened, impunctate, the apex notched; surface concave, coarsely and closely punctured. Elytra much broader than the thorax, broadly oblong, slightly narrowed towards the apex; above convex, transversely excavated below the basilar space, the latter slightly thickened; humeral callus elevated, obtuse; surface sparingly clothed with somewhat coarse suberect hairs, coarsely punctured, the puncturing irregular at the base, arranged in longitudinal striæ towards the apex, interspaces at the base thickened, elevate-reticulate behind the middle, thickened and subcostate. Intermediate pair of tibiæ thickened and flexuose at the apex, hinder tibiæ armed at the apex with a long acute spine.

Genus EUMOLPUS, Weber.

I have here made an attempt to monograph the genus *Eumolpus*. For some years past I have been accumulating materials for the purpose, my own cabinet having been formed from the collections of the late A. Deyrolle, H. W. Bates, W. W. Saunders and others.

I am thus in possession of a long series of specimens of several of the more variable species, without which it would have been almost impossible to fix their specific limits.

I have found colour of but slight use in separating these insects, but have in many instances discovered good characters in the form of the pro- and meso-sterna, in the form and sculpturing of the apical segment of the abdomen, and (in the male sex) the form of the *telum*, or ♂ organ.

Out of the ten species described, three have been previously characterized, and the rest are new.

LIST OF SPECIES.

Eumolpus ignitus, Fabr.	Eumolpus imperialis, n. sp.
„ separatus, n. sp.	„ speciosus, n. sp.
„ nitidus, n. sp.	„ Batesii, n. sp.
„ surinamensis, Fabr.	„ carinatus, n. sp.
„ australis, n. sp.	„ prasinus, Erichs.

Digitized by Google

Eumolpus ignitus, Fabr.

Mant. i. p. 68; Oliv. Ent. vi. p. 897, pl. i. fig. 1.
cupreus, Oliv. l. c. p. 897, pl. i. fig. 2.
fulgidus, Weber, Obs. Ent. p. 52.
alutaceus, Germ. Ins. Spec. Nov. p. 561.

Elongato-ovatus, postice attenuatus ♂, oblongo-ovatus ♀, convexus, nitidus, antennis extrorsum nigris; thorace tenuiter, irregulariter punctato, lateribus a basi ad apicem convergentibus; elytris convexis, callo humerali incrassato; sat crebre punctatis, interstitiis lævibus aut rugulosis; tibiis anticis basi curvatis, deinde ad apicem fere rectis; prosterno latitudine longiori, oblongo, postice ampliato, margine postico concavo-emarginato, angulis posticis obtuse rotundatis ♂, magis acutis ♀; mesosterno latitudine longiori, apice dilatato, trilobato, apice ipso depresso; palporum maxillarium articulis duobus ultimis conjunctim elongato-ovatis.

Mas.—Abdominis segmento ultimo apice obtuse truncato, dorso foveâ subrotundatâ, transversâ, medio plerumque vittâ elevatâ divisâ, sat profunde impresso; *telo* brevi, abrupte curvato, apice obtuse rotundato, medio dente brevi acuto armato; subtus submembranaceo.

Fœm.—Abdominis segmento ultimo obtuse rotundato, apice integro.

A. Corpus metallico-viridis aut æneus, sæpe cæruleo-tinctus.
   a. Elytris concoloribus.
   b. Elytris aureis aut viridi-aureis, interdum viridi-marginatis.
   c. Elytris metallico-violaceis, purpureo-tinctis.
B. Corpus metallico-purpureus aut cæruleus.
   a. Elytris metallico-viridibus aut æneis aut aureis, interdum viridi-marginatis.
   b. Elytris metallico-violaceis.

Long. 7—11 lin.

Hab.—Brazil, Cayenne, Bogotà.

Head punctured, finely granulose; clypeus not longer than broad, sides obliquely narrowed from the front towards the apex; apical margin usually obsolete, when present visible only at the sides, transverse; antennæ moderately robust, not thickened towards the apex in either sex; third joint distinctly longer than the fourth; labrum and jaws black. Thorax nearly twice as broad as long, sides converging from base to apex, nearly straight behind the middle, rounded in front, all the angles acute; upper sur-

Digitized by Google

face finely and irregularly but not very closely punctured; interspaces smooth and shining, sometimes finely granulose and subopaque. Scutellum semioblong-ovate. Elytra much broader than the thorax, oblong; above very convex, the humeral callus strongly thickened; surface rather closely punctured, interspaces sometimes smooth and shining, and only impressed with a few minute punctures; in other specimens distinctly rugose, every stage being found between the two extremes. Legs robust.

This variable species is apparently very abundant in Brazil, and from its large size and brilliant colours has attracted the notice of most collectors. I have received it, although less commonly, from Cayenne and other parts of South America. Its elytra are, as a rule, more coarsely punctured than in any other species of the genus; the V-form of the abdominal fovea, which is not produced to the outer margin of the segment, together with the short telum, will distinguish the ♂ from the same sex of *E. fulgidus* and allied species; the ♀ may be separated by the peculiar form of its prosternum.

Eumolpus separatus.

Oblongo-ovatus, convexus, metallico-purpureus, nitidus, supra subopacus, antennis nigris; thorace elytrisque tenuissime punctatis, prosterno longitudini fere æquilato, postice ampliato, margine postico vix concavo-emarginato, angulis posticis acutis, apice obtusis; mesosterno latitudine longiori, apice trilobato, lobis lateralibus parvis, lobo apicali brevi, lato, obtuse truncato; tibiis anticis leviter curvatis; palporum maxillarium articulis duobus apicalibus rotundato-ovatis, apice obtuso; antennis robustis, articulis quinque ultimis distincte incrassatis, 3tio ad 5tum inter se fere æquilongis.

Mas.—Abdominis segmento ultimo apice obtuse truncato, dorso foveâ subrotundatâ, marginem non attingente, sat profunde impresso; *telo* brevi, abrupte curvato, apice obtuse- aut subovato-rotundato, dente brevi armato.

Fœm.—Abdominis segmento ultimo apice integro, dorso leviter transversim impresso.

Hab.—La Plata, Monte Video, also Brazil (Espirito Santo).

Var. A. Corpore supra viridi-olivaceo, metallico.

Head subremotely punctured, finely granulose; clypeus subcampanulate, its apex broadly obsolete; antennæ

Digitized by Google

robust, the third, fourth and fifth joints equal in length; five upper joints slightly thickened. Thorax nearly twice as broad as long, sides rounded and converging from base to apex, less distinctly rounded behind the middle, all the angles acute; upper surface finely granulose, minutely but not closely punctured. Scutellum semiovate, nitidous. Elytra broader than the thorax, convex, the humeral callus prominent; surface minutely granulose, reticulate-strigose, finely but not closely punctured.

This insect, which at first sight might be taken for a small opaque variety of *E. ignitus*, is separated from that species by the different shape of the apex of the prosternum. The *telum* in the ♂ is also different in form.

Eumolpus nitidus.

Anguste oblongo-ovatus, convexus, viridi-æneus, nitidus, antennis purpureis, extrorsum nigris; thorace longitudine duplo latiori, lateribus rotundatis, basi fere parallelis, antice convergentibus; disco granuloso, subcrebre punctato; elytris thorace paullo latioribus, oblongis, sat crebre punctatis; prosterno postice longitudine latiori, margine postico leviter emarginato, angulis posticis acutis, apice obtusis; mesosterno transverso, apice paullo dilatato, late truncato; tibiis anticis modice curvatis; palporum articulo penultimo ultimo longiori, cum illo conjunctim ovato.

Var. A. Metallico-purpureus, elytris viridi-æneis.

„ B. Totus metallico-purpureus.

Mas.—Abdominis segmento ultimo apice late truncato, dorso foveâ subrotundatâ, marginem non attingente profunde impresso; *telo* brevi, abrupte curvato, apice angulato, acuto.

Fœm.—Abdominis segmento ultimo apice obtuse rotundato, medio angulato-emarginato.

Long. 5—7 lin.

Hab.—Amazon, Cayenne.

Head granulose, finely but distinctly punctured, front impressed with a faint, longitudinal groove; clypeus semi-oblong-ovate, its apical suture broadly obsolete; labrum and jaws black; antennæ moderately robust, five outer joints very slightly thickened, third distinctly longer than the fourth. Thorax twice as broad as long; sides rounded, subparallel at the base, converging in front, all the angles acute; above transversely convex, sides deflexed in front,

Digitized by Google

finely granulose, subnitidous, impressed rather closely with fine but distinct punctures. Scutellum semioblong-ovate, its apex rounded; surface smooth, impressed near the apex with a deep fovea. Elytra rather broader than the thorax, sides parallel, slightly converging near the apex in the ♂; above convex, distinctly punctured, interspaces finely but not closely punctured, impressed here and there with fine irregular strigæ; humeral callus moderately thickened, very obtuse. Legs robust.

The ♂ of this species may be distinguished from *E. ignitus* by its broader thorax, the different shape of the abdominal fovea, and by the difference in the form of the *telum;* the same characters, with the addition of the closer punctuation of its upper surface, separate it from *E. surinamensis;* the ♀ is at once distinguished from either by the emarginate apex of the last abdominal segment.

Eumolpus surinamensis, Fabr.

Syst. Ent. p. 96 (type in Brit. Mus.). Oliv. Ent. p. 898; *Chrysomela*, pl. i. fig. 4a, b.

Eumolpus fulgidus, Oliv. Entom. vi. p. 898, pl. i. fig. 3.

Elongato-ovatus, plerumque postice attenuatus ♂; oblongo-ovatus ♀, convexus, viridi- aut cæruleo- aut purpureo-metallicus, nitidus, antennis extrorsum nigris; thorace lateribus basi rectis, antice rotundato-angustatis; disco tenuissime punctato; elytris minus crebre, tenuiter punctatis; prosterno latitudine paullo longiori, ad apicem ampliato, margine postico vix concavo, angulis posticis acutis, apice obtusis; mesosterno longitudine vix latiori, apice obtuso; tibiis anticis leviter curvatis; palporum maxillarium articulis duobus ultimis longitudine fere æqualibus, ultimo ovato compresso, antice attenuato, apice obtuso.

Mas.—Abdominis segmento ultimo apice truncato aut leviter concavo-emarginato, foveâ semiovatâ, marginem attingente sat profunde impresso; *telo* curvato, ad apicem non ampliato, apice rotundato-ovato, acuto.

Fœm.—Abdominis segmento ultimo obtuse rotundato, apice sæpe obsolete emarginato.

Long. 3½—10 lin.

Hab.—Cayenne, Banks of the Amazon, Mexico, Brazil.

Head finely and usually very remotely punctured, in

Digitized by Google

some specimens the puncturing is rather closer; clypeus rather longer than broad, sides converging from the front towards the apex, curved, apical margin usually obsolete, when present only visible on either side, transverse; antennæ moderately robust, five upper joints slightly thickened, third joint longer than the fourth, fourth and fifth equal. Thorax about one-third broader than long, sides rounded and converging in front; upper surface remotely and very finely punctured; the puncturing varies in density, being in some specimens nearly obsolete; interspaces impressed with very minute punctures, visible only under a deep lens. Scutellum trigonate-ovate. Elytra oblong, slightly attenuated towards the apex in the ♂, broader than the thorax; above convex, the humeral callus prominent; surface finely but not very closely punctured. Legs robust.

This species, which, like *E. ignitus*, is very variable in colour, is almost equally as common as that insect; it is found over a large extent of the South American Continent, but its metropolis appears to be Cayenne and the Amazon region.

It is smoother and more shining, and as a rule less strongly punctured than *E. ignitus;* the ♂ is to be known by the longer *telum* and by the difference in form of the abdominal fovea. In the present insect the latter is produced to the apical margin of the segment; both sexes are to be at once distinguished by the much less distinct emargination of the hinder border of the prosternum.

Eumolpus australis.

Elongato-ovatus ♂, minus elongatus ♀, convexus, æneus, viridi-purpureo micans, aut totus metallico-purpureus, nitidus, antennis purpureis, extrorsum nigris; thorace lateribus rectis, fere parallelis, ad apicem rotundato-angustatis; dorso convexo, subremote, tenuiter punctato; elytris distincte punctatis; prosterno latitudine longiori, postice ampliato, margine postico vix concavo-emarginato, angulis posticis acutis, apice obtusis; mesosterno latitudine paullo longiori, apice paullo dilatato, obtuso, utrinque sinuato; pedibus robustis, tibiis anticis ♂ sat valde, ♀ leviter curvatis; palporum maxillarium articulo ultimo penultimo vix æquilongo, subovato.

Mas.—Abdominis segmento ultimo apice obtuse truncato, dorso foveâ magnâ subquadrato-ovatâ ad marginem

Digitized by Google

extensâ, medio vittâ elevatâ separatâ, profunde impresso; *telo* brevi, abrupte curvato, apice obtuse truncato, medio dente brevissimo armato.

Fœm.—Abdominis segmento ultimo apice integro, obtuse rotundato.

Long. 5—6½ lin.

Hab.—Cordova, Pampas of Peru.

Head finely but not closely punctured, impressed here and there with coarse punctures, which are scattered irregularly on the surface; clypeus subquadrate, its sides nearly parallel, its apical margin entirely obsolete; antennæ moderately robust, five outer joints slightly thickened, third joint distinctly longer than the fourth in the ♂; the two joints nearly equal in length in the ♀. Thorax about one-half broader than long; sides straight and nearly parallel from the base to the middle, thence rounded and converging to the apex, all the angles acute; above convex, distinctly punctured, interspaces minutely punctured. Scutellum narrow, subcuneiform, its surface nitidous, minutely punctured. Elytra much broader than the thorax, the sides parallel, the apex subacutely rounded in the ♂; above convex, rather coarsely but not very closely punctured, interspaces minutely punctured, impressed with a few irregular strigæ; humeral callus prominent, humeral angle tinged with aureous.

The narrow convex thorax is the principal character separating the ♀ of the present species from *E. surinamensis*; the same character, together with the difference in the abdominal fovea and the shorter *telum*, separates the ♂ from the same sex of that insect.

Eumolpus imperialis.

Elongato-ovatus ♂, oblongo-ovatus ♀, convexus, metallico-purpureus, violaceo- vel æneo-micans; thorace lateribus rotundatis, ad apicem convergentibus, disco granuloso, tenuiter punctulatis; elytris sat crebre, distincte punctatis; tibiis leviter curvatis; prosterno longitudini fere æquilato, postice ampliato, margine postico truncato, angulis posticis acutis, apice obtusis; mesosterno latitudini æquilongo, apice dilatato, obtuso, obsolete angulato; palporum maxillarium articulis duobus ultimis conjunctim ovatis.

Mas.—Abdominis segmento ultimo apice concavo-emar-

Digitized by Google

ginato, dorso foveâ magnâ subrotundatâ ad marginem extensâ leviter impresso; *telo* elongato, basi curvato, apice spathulato, paullo recurvato, apice ipso dente brevi armato.

Fœm.—Abdominis segmento ultimo apice leviter emarginato, dorso foveâ magnâ male definitâ leviter excavato.

Long. 5½—8⅓ lin.

Hab.—Cayenne, Martinique.

Head granulose, subrugulose, rather coarsely punctured; front impressed with a longitudinal groove, which is sometimes obsolete; clypeus scarcely broader than long, sides straight, obliquely converging from the anterior margin towards the apex, the apical margin entirely obsolete; antennæ less slender than in *E. speciosus*, the five outer joints very slightly thickened in both sexes; third and fifth joints equal, each longer than the fourth. Thorax nearly twice as broad as long; sides rounded, converging at base and apex, rarely parallel at the base in the ♀; above minutely granulose, finely but distinctly punctured. Scutellum semiovate, excavated at the base. Elytra much broader than the thorax; above convex, humeral callus prominent; surface nitidous, rather coarsely punctate, interspaces finely punctured, impressed (but not very closely) with fine, irregular striæ.

Eumolpus speciosus.

Elongato-ovatus, convexus, metallico-purpureus, nitidus, sæpe violaceo-micans, antennis gracilibus; thorace lateribus rotundatis, ad apicem convergentibus; dorso tenuissime punctato; elytris anguste oblongis, postice attenuatis, sat crebre, distincte punctatis; tibiis modice curvatis; prosterno longitudini fere æquilato, postice ampliato, margine postico recto, angulis posticis acutis, apice obtusis; mesosterno latitudini æquilongo, apice dilatato, obtuse rotundato; palporum maxillarium articulis duobus ultimis æquilongis, conjunctim ovatis, ultimo conico.

Mas.—Abdominis segmento ultimo integro, apice extremo obtuso; dorso non foveolato, utrinque punctato, medio vittâ lævi impunctato instructo; *telo* elongato, basi curvato, ad apicem recurvato, vix ampliato, apice ipso obtuso, utrinque excavato, medio breviter producto, truncato.

Fœm.—Abdominis segmento ultimo apice obtuse trun-

Digitized by Google

cato, dorso punctato, foveâ trigonatâ lævi, male definitâ, leviter impresso.

Long. 6½—8 lin.

Hab.—Cayenne.

Head finely granulose, subnitidous, impressed with small but distinct round punctures; clypeus elongate and wedge-shaped in the ♂, broader and less distinctly cuneiform in the ♀, its apical margin broadly obsolete in both sexes; jaws and labrum nigro-piceous; front impressed with a shallow fovea, from which the faint traces of a longitudinal groove extend upwards to the vertex; antennæ slender, the third and fifth joints equal in length, each distinctly longer than the fourth; five upper joints not thickened in the ♂, very slightly so in the ♀. Thorax nearly twice as broad as long; sides rounded, nearly parallel at the base, converging at the apex, all the angles acute; upper surface finely granulose, subnitidous, impressed rather closely with shallow round punctures. Scutellum trigonate-ovate, impressed with a few coarse punctures. Elytra much broader than the thorax, narrowly oblong; sides parallel, the apex subacutely rounded; above convex, faintly excavated below the scutellum, the humeral callus prominent; surface coarsely and rather closely punctured; interspaces nitidous, minutely punctured, impressed with irregular strigæ.

E. speciosus is closely allied to the preceding *E. imperialis;* the ♂ is separated by the difference in the abdominal segment and by the slender antennæ, as well as by the entirely different *telum;* it is separated from *E. Batesii* by the same character, and by the more parallel sides of the thorax; the narrower and more parallel form of the ♀ will distinguish it from the same sex of either species.

Eumolpus Batesii.

Elongato-ovatus, convexus, metallico-cæruleus, nitidus, subtus viridi-micans, antennis extrorsum nigris; thorace latitudine duplo latiori, lateribus rotundatis, basi et apice convergentibus, subnitido, tenuiter punctato, interstitiis granulosis; elytris granulosis, distincte punctatis, interspatiis hic illic leviter et irregulariter strigosis; prosterno longitudini postice æquilato, ad apicem ampliato, margine postico leviter emarginato, angulis posticis obtusis; mesosterno latitudine longiori, apice trilobato, lobis lateralibus parvis sæpe indistinctis, lobo apicali brevi, late truncato;

Digitized by Google

palporum maxillarium articulis duobus ultimis æquilongis, conjunctim ovatis.

Mas.—Tibiis apice in dentem brevem acutum extrorsum productis, tibiis anticis leviter curvatis; abdominis segmento ultimo integro, obtuse rotundato, dorso medio longitudinaliter depresso, utrinque obsolete mamillato; *telo* elongato, basi curvato, apice spathulato, apice ipso obtuse truncato, medio dente acuto, paullo recurvato armato.

Fœm.—Abdominis segmento ultimo apice integro.

Long. 6½—7 lin.

Hab.—Amazon; collected by Mr. Bates.

Head finely granulose, irregularly but not closely punctured; clypeus distinctly longer than broad, sides slightly rounded, obliquely converging from the front towards the apex, apical margin obsolete; antennæ slender, five upper joints not thickened in the ♂, very slightly thickened in the ♀; third and fifth joints equal in length, each longer than the fourth in the ♂; third and two following joints nearly equal in the ♀; jaws and labrum nigro-piceous. Thorax twice as broad as long; sides rounded, converging at base and apex, all the angles acute; above transversely convex, finely granulose, impressed with fine round punctures. Scutellum semiovate, smooth, impressed with a few fine punctures. Elytra rather broader than the thorax, oblong, convex, faintly excavated below the scutellum, coarsely and rather closely punctured, interspaces minutely but not closely punctured, sparingly impresso-strigose. Legs slender, thickened apices of tibiæ produced outwardly into a short acute tooth.

Eumolpus carinatus.

Oblongo-ovatus, convexus, metallico-purpureus, violaceo- aut æneo-micans, antennis obscure viridi-æneis, extrorsum nigro-æneis; thorace lateribus rotundatis, ad apicem deflexis; dorso granuloso, subnitido, tenuiter punctulato; elytris circa scutellum obsolete excavatis, sat crebre punctatis, infra callum humerale vittâ elevatâ brevi instructis; tibiis vix curvatis; prosterno longitudine latiori, postice ampliato, margine postico truncato, medio vix sinuato, angulis posticis acutis, apice obtusis; mesosterno latitudine longiori, ad apicem dilatato, trilobato, lobis lateralibus parvis, lobo apicali brevi, lato, obtuse angulato, apice depresso; palporum maxillarium articulis duobus ultimis conjunctim ovatis.

Digitized by Google

Fœm.—Abdominis segmento ultimo utrinque sinuato, medio paullo producto, rotundato-ovato; dorso lævi, impunctato.

Long. 7½—8½ lin.

Hab.—Amazon.

Head granulose, sparingly punctured; vertex and front impressed with a fine longitudinal groove; clypeus broadly wedge-shaped, its apex broadly obsolete; antennæ slender, five upper joints not distinctly thickened, third joint rather longer than the fourth. Thorax twice as broad as long; sides rounded, converging at base and apex, hinder angles armed with an obtuse tubercle; upper surface granulose, impressed, but not very closely, with fine round punctures. Scutellum semiovate, impressed near the apex with a deep fovea, this latter sometimes obsolete. Elytra oblong, sides parallel, the apex subacutely rounded; upper surface convex, obsoletely excavated near the scutellum, granulose, rather closely punctured; below the humeral callus, occupying the middle third of the elytron, is a raised longitudinal vitta, the apex of which is bent inwardly towards the suture; on the disk of each elytron are also several faint longitudinal costæ, only visible in a certain light. Legs slender, apices of tibiæ unarmed.

This species, of which I only possess three individuals, all ♀, closely resembles the ♀ of *E. Batesii;* it may at once be known by the different form of the apical segment of the abdomen, and also by its larger size.

Eumolpus prasinus, Erichs.

Elongatus, convexus, metallico-viridis aut purpureus, antennis nigro-viridibus, extrorsum nigris; thorace lateribus rotundatis, disco granuloso, tenuiter punctato; elytris anguste oblongis, parallelis, sat crebre punctatis; tibiis vix curvatis; prosterno latitudine multo longiori, postice ampliato, margine postico recte truncato, angulis posticis acutis, apice obtusis; mesosterno latitudine fere duplo longiori, apice dilatato, obtuse rotundato, apice ipso truncato; palporum articulis duobus ultimis æquilongis, ultimo subovato, apice obtuso.

Mas.—Abdominis segmento ultimo apice truncato, dorso medio leviter excavato, utrinque leviter elevato, rude punctato; *telo* elongato, basi curvato, apice subspathulato, apice ipso recurvato, obtuse rotundato, dente acuto armato.

Fœm.—Elytris infra callum humerale vittâ elevatâ brevi

Digitized by Google

instructis; abdominis segmento ultimo apice late concavo-emarginato.

Var. A. fœm.—Minor, elytrorum vittâ elevatâ obsoletâ.

Head finely granulose, impressed, but not very closely, with shallow round punctures; clypeus distinctly longer than broad, subcuneiform, its apical margin broadly obsolete; antennæ slender, the third joint distinctly longer than the fourth, the fourth, fifth and sixth equal. Thorax nearly twice as broad as long; sides rounded, converging at base and apex; above transversely convex, minutely granulose, subnitidous, impressed with fine but distinct round punctures. Scutellum smooth and shining, semi-ovate. Elytra rather broader than the thorax, subelongate; sides parallel, the apices subacutely rounded; upper surface coarsely and rather closely punctured, interspaces nitidous, finely granulose, sparingly impresso-strigose. Legs slender, thickened apices of tibiæ unarmed.

This insect is closely allied to *E. Batesii;* the ♂ may be known by the absence of the spine at the outer apex of the tibia, together with the different form of the *telum;* the ♀ is separated from the two preceding species by its narrower and more parallel form, and by the emargination of the apical segment of the abdomen.

Digitized by Google

V. *Descriptions of new species of the genera* Pseudomyrma *and* Tetraponera, *belonging to the family* Myrmicidæ. By Frederick Smith.

[Read 4th April, 1877.]

Of the first of these genera twenty new species are described, and a list, with references, of those already known to science; five new species are added to the nine previously described species of the genus *Tetraponera*.

The habits of the ants belonging to these two genera, according to the observations of naturalists, appear to be varied. Some species construct their formicarium in the pith of dead branches of various trees and shrubs; others perforate the hollow thorns of species of *Acacia*, and Mr. Bates observed a Brazilian species, *Pseudomyrma termitaria*, forming its elliptical chambers in the walls of the tumuli of a species of *Termes;* others inhabit the hollow bullæ, formed at the apex of the leaf-stalk of many species of exotic trees. Their colonies are not numerous in individuals, and their pupæ are not enclosed in cocoons. This is the case in the majority of the genera belonging to the family *Myrmicidæ;* but, like most general rules, exceptions are to be met with. Thus we learn that, in the species of the genus *Myrmecia*, all the sexes are inclosed; and it may be observed, that even in other genera of ants, *Formica* for instance, although as a rule all the larvæ spin themselves up in cocoons, yet, under certain conditions of situation or of atmospheric suitability, it is pretty certain that occasionally all the species of *Formica* found in this country undergo their metamorphoses, passing through the pupa state naked. This has been observed at different times, both by myself and by others.

Note.—The type specimen of such species as are enumerated in the list to which an * is prefixed, are in the British Museum.

Digitized by Google

Genus Pseudomyrma.

Pseudomyrma, Guér. Icon. Règ. Anim. 427, ☿ (1838).
Myrmex, Guér. lib. cit. 427, ♀ (1838).
Leptalea, Spin. Mem. Accad. Torino, xiii. 68 (1853).

Head wider than the thorax; antennæ clavate, 12-jointed in all the sexes; eyes very large, elongate-ovate; ocelli three in all the sexes. Thorax elongate-ovate in the females, narrowed posteriorly in the workers; anterior wings with one marginal and three submarginal cells, the third cell extending to the apex of the wing. Abdomen oblong, with two nodes, the first more or less pedunculated; the females and workers with four segments, exclusive of the basal nodes, the males having five segments.

1. *Pseudomyrma bicolor*, Guér. Icon. Règ. Anim. 427, ☿; Smith, Trans. Ent. Soc. New Ser. iii. 157.
   Hab.—Columbia; Panama.

2. *Pseudomyrma mandibularis* (*Leptalea*, Spin.), Mem. Accad. Torino, xiii. (1853), p. 68.
   Hab.—Pará.

3. *Pseudomyrma unicolor*, Smith, Trans. Ent. Soc. Lond. New Ser. iii. 158, ☿.
   Hab.—Brazil.

*4. *Pseudomyrma termitaria*, Smith, Trans. Ent. Soc. Lond. New Ser. iii. 158, ♀, ☿.
   Hab.—Santarem.

5. *Pseudomyrma maculata*, Smith, Trans. Ent. Soc. Lond. New Ser. iii. 158, ☿.
   Hab.—Brazil.

6. *Pseudomyrma sericata*, Smith, Trans. Ent. Soc. Lond. New Ser. iii. 159, ☿.
   Hab.—Brazil.

7. *Pseudomyrma elegans*, Smith, Trans. Ent. Soc. Lond. New Ser. iii. 159, ☿.
   Hab.—Pará.

Digitized by Google

*8. *Pseudomyrma nigriceps*, Smith, Trans. Ent. Soc. Lond. New Ser. iii. 159, ☿.
Hab.—Santarem.

*9. *Pseudomyrma oculata*, Smith, Trans. Ent. Soc. Lond. New Ser. iii. 159, ♀, ☿.
Hab.—Santarem.

*10. *Pseudomyrma pallida*, Smith, Trans. Ent. Soc. Lond. New Ser. iii. 160, ☿.
Hab.—East Florida.

11. *Pseudomyrma Perboscii*, Guér. Icon. Règ. Anim. 428, ♀.
Hab.—Campeachy, Central America.

*12. *Pseudomyrma cephalica*, Smith, Trans. Ent. Soc. Lond. New Ser. iii. 168, ♂, ♀, ☿.
Formica filiformis, Fab. Syst. Piez. 405?
Hab.—Villa Nova, River Amazon.

*13. *Pseudomyrma phyllophila*, Smith, Cat. Hym. Ins. Form. pt. vi. 156, ☿.
Hab.—Rio.

*14. *Pseudomyrma ejecta*, Smith, Cat. Hym. Ins. Form. pt. vi. 157, ☿.
Hab.—Brazil?

*15. *Pseudomyrma flavidula*, Smith, Cat. Hym. Ins. Form. pt. vi. 157, ☿.
Hab.—Santarem.

*16. *Pseudomyrma faber*, Smith, Cat. Hym. Ins. Form. pt. vi. 157.
Hab.—Ega.

*17. *Pseudomyrma cladoica*, Smith, Cat. Hym. Ins. Form. pt. vi. 157, ☿.
Hab.—Ega.

*18. *Pseudomyrma vidua*, Smith, Cat. Hym. Ins. Form. 158, pt. vi. ♂.
Hab.—Ega.

Digitized by Google

*19. *Pseudomyrma ligniseca*, Smith, Cat. Hym. Ins. Form. pt. vi. 158, ♀.
Hab.—Ega.

*20. *Pseudomyrma venusta*, Smith, Cat. Hym. Ins. Form. pt. vi. 158, ♀.
Hab.—Ega.

21. *Pseudomyrma minuta*, Jerdon, Madr. Journ. Lit. & Sc. (1851), 112, ☿.
Hab.—The Carnatic and Malabar.

22. *Pseudomyrma rufipes*, Jerdon, Madr. Journ. Lit. & Sc. (1851), 112, ☿.
Hab.—India (Salem district).

*23. *Pseudomyrma pilosa*, Smith, Cat. Hym. Ins. Form. pt. vi. 160, ☿.
Hab.—Borneo.

24. *Pseudomyrma Capensis*, Smith, Cat. Hym. Ins. Form. pt. vi. 160, ☿.
Hab.—Cape of Good Hope.

25. *Pseudomyrma modesta*, Smith, Proc. Linn. Soc. Zool. v. 106, ☿ (1861).
Hab.—Bachian.

26. *Pseudomyrma nitida*, Smith, Proc. Linn. Soc. Zool. v. 106, ☿.
Hab.—Bachian.

27. *Pseudomyrma gracilis* (*Formica*, Fabr.), Syst. Piez. 405, ☿.
Hab.—S. America.

28. *Pseudomyrma tenuis* (*Formica*, Fabr.), Syst. Piez. 405, ☿.
Hab.—S. America.

29. *Pseudomyrma filiformis* (*Formica*, Fabr.), Syst. Piez. 405.
Hab.—S. America.

Digitized by Google

*30. *Pseudomyrma perforator*, Smith, Journ. Ent. i. 69, ♀.
Hab.—Ega.

*31. *Pseudomyrma agilis*, Smith, Journ. Ent. i. 70, ♀.
Hab.—St. Paulo.

32. *Pseudomyrma concolor*, Smith, Journ. Ent. i. 70, ♀.
Hab.—St. Paulo.

*33. *Pseudomyrma atripes*, Smith, Journ. Ent. i. 70, ♀.
Hab.—Brazil.

34. *Pseudomyrma boopis*, Roger, Berl. Ent. Zeitschr. (1863), vii. 25.
Pseudomyrma modesta, Smith, Trans. Ent. Soc. Lond. (1862), 32, ♀.
Hab.—Panama.

35. *Pseudomyrma dimidiata*, Roger, Berl. Ent. Zeitschr. (1863), vii. 177, ♀.
Hab.—Columbia.

36. *Pseudomyrma mexicana*, Roger, Berl. Ent. Zeitschr. (1863), vii. 178, ♀.
Hab.—Mexico, Nicaragua.

37. *Pseudomyrma excisa*, Mayr, Akad. der Wissensch. zu Wien (1872), p. 410, ♀.
Hab.—New Granada.

38. *Pseudomyrma sericea*, Mayr, Akad. der Wissensch. zu Wien (1872), p. 412, ♀.
Hab.—New Granada.

39. *Pseudomyrma elongata*, Mayr, Akad. der Wissensch. zu Wien (1872), p. 413, ♀.
Hab.—New Granada.

40. *Pseudomyrma pallens*, Mayr, Akad. der Wissensch. zu Wien (1872), p. 411, ♀, ♀.
Hab.—New Granada.

Digitized by Google

41. *Pseudomyrma lævigata.*

Worker.—Length 4¾ lines. Pale yellow, or sometimes reddish-yellow, and very smooth and shining. Head narrowed in front and behind; eyes very large; front of the head, mandibles, and basal portion of the antennæ occasionally, whitish-yellow; the teeth of the mandibles black. Thorax rounded anteriorly, the lateral margins acute, the disk flattened and somewhat arched; deeply impressed between the meso- and meta-thorax; the latter narrower than the prothorax. Abdomen: the first node about the same length as the petiole, and half the width of the second; the entire body and legs thinly sprinkled with erect pale hairs.

Hab.—Ega on the Amazon. Type in the British Museum.

42. *Pseudomyrma variabilis.*

Worker.—Length 3—3¾ lines. Black, with the front margin of the head, the mandibles, the base, and apex of the scape and of the flagellum, also the anterior tibiæ and tarsi and the apex of the femora, reddish-yellow, covered with a fine hoary pubescent pile; the intermediate tibiæ and apex of the femora, as well as the posterior ones, more or less rufo-testaceous; eyes large, the head slightly narrowed behind. Thorax with the lateral margins acute, flattened above; deeply strangulated between the meso- and meta-thorax, the latter arched longitudinally and not elevated higher than the prothorax. The first node of the abdomen clavate, the second subglobose.

Some specimens are pale reddish-yellow, with the abdomen blackish; several intermediate states of coloration occur.

Hab.—Barbadoes. Type in the British Museum.

43. *Pseudomyrma pilosula.*

Worker.—Length 5—5¼ lines. Black, and covered with a fine changeable hoary pile; the anterior margin of the head, the mandibles, anterior tibiæ, tarsi and tips of the femora reddish-yellow; the front slightly depressed longitudinally in the middle, the vertex rounded behind. The thorax with the sides flat, slightly rounded above, the lateral margins acute: the metathorax arched longitudinally, not elevated higher than the prothorax. The peduncle of the abdomen short, the first node subglobose,

Digitized by Google

the second nearly twice as wide; abdomen oblong, its apex with a number of long hairs.

Hab.—Barbadoes. The type in the British Museum.

44. *Pseudomyrma læviceps.*

Worker.—Length 1½ line. Black, with the head before the insertion of the antennæ, the mandibles, antennæ, prothorax, and nodes of the peduncle of the abdomen, pale ferruginous; the legs dark rufo-piceous, with the tarsi and tips of the femora pale rufo-testaceous; the anterior legs palest. The head very smooth and shining; oblong-quadrate; the eyes large, extending nearly to the base of the mandibles. Thorax half the width of the head anteriorly, narrowed to the apex of the metathorax; the petiole short; the first node oblong and narrow, the second transverse, posteriorly ridged, convex in front of the ridge; abdomen oblong, heart-shaped.

Hab.—Pará. Type in the British Museum.

45. *Pseudomyrma distincta.*

Worker.—Length 2 lines. Pale testaceous-yellow, with the head and metathorax black and shining. Head oblong, narrowed behind the eyes, which are large and ovate; the antennæ, mandibles, and anterior margin of the face, pale testaceous, the mandibles almost white. Thorax about the same length as the head, narrowed posteriorly; the anterior and intermediate coxæ and femora black. Abdomen oblong-ovate; the first node petiolate and clavate, the second subglobose.

Hab.—Mexico.

46. *Pseudomyrma brunnea.*

Worker.—Length 1½ line. Dark brown, the abdomen nearly black. The head large, oblong-quadrate, widest anteriorly; the eyes large, ovate, and a little more than half the length of the head; mandibles pale yellow. Thorax about the same length as the head; the prothorax rounded, the metathorax short, oblique posteriorly. Abdomen smooth and shining, oblong-cordate, pointed at the apex; each node with a short petiole, the second transverse.

Hab.—Mexico.

Digitized by Google

47. *Pseudomyrma ferruginea.*

Worker.—Length 2¾ lines. Ferruginous; the head oblong-ovate, slightly emarginate behind; very finely and closely punctured; a longitudinal impressed line runs from the anterior ocellus to the insertion of the antennæ; the eyes black, and scarcely half the length of the head; the antennæ and cheeks with a fine, thin, white pile. Thorax oblong; strangulated in the middle; rounded anteriorly and posteriorly; the metathorax not elevated; sprinkled with a few erect hairs. Abdomen oblong-ovate, pointed at the apex, and covered with a thin white pile; more or less fuscous beyond the second node; the petiole of the first node short, the node ovate and much narrower than the second node.

Hab.—Mexico. Type in British Museum.

48. *Pseudomyrma rufa.*

Worker.—Length 3¼ lines. Rufous; the scape, basal half of the flagellum, the mandibles, the anterior tibiæ, the base of the intermediate and posterior pairs, the base and apex of the femora, and the tarsi, pale rufo-testaceous; the eyes very large, occupying two-thirds of the length of the head; the prothorax flattened, its margins slightly raised; the metathorax elevated above the prothorax, flattened on the disk. Abdomen: the first node compressed, channelled above, and emarginate posteriorly; the second node subglobose.

Hab.—Amazons, Brazil.

49. *Pseudomyrma terminalis.*

Female.—Length 2 lines. Head, thorax, legs, and nodes of the abdomen, pale rufo-testaceous; the abdomen black; the ocelli and eyes black; the latter oblong-ovate; large, and occupying two-thirds of the length of the head. Thorax elongate; the meso- and meta-thorax a little darker than the head or prothorax; smooth and shining; the intermediate and posterior femora slightly rufo-piceous in the middle; abdomen glossy black.

Hab.—Pará. Type in the British Museum.

50. *Pseudomyrma simplex.*

Worker.—Length 1⅔ line. Pale reddish-yellow, very smooth and shining, a pale fuscous spot on each side of

Digitized by Google

the basal segment of the abdomen; the eyes large, oblong-ovate, jet black, and about half the length of the head; the head oblong, widest in front, and moderately narrowed posteriorly. Thorax oblong, strangulated in the middle; the metathorax obliquely truncate. The petiole of the abdomen short; the first node oblong, the second globose, the abdomen oblong-ovate; pointed at the apex.

Hab.—St. Paulo. Type in the British Museum.

51. *Pseudomyrma urbana.*

Worker.—Length 2 lines. Reddish-yellow, the femora, the apex of the abdomen, and its base at the sides, more or less fuscous; the insect smooth and shining, the head and thorax brightest. The head oblong, the sides nearly parallel but slightly narrowed behind; the eyes black, very large, more than half the length of the head, including the projected mandibles. The thorax oblong, constricted in the middle, posteriorly rounded and oblique. The petiole of the first node of the abdomen short, the node subglobose; the second node globose.

Hab.—Ega on the Amazon. Type in the British Museum.

52. *Pseudomyrma fervida.*

Worker.—Length 2 lines. Head and thorax ferruginous, the abdomen obscure. Head oblong, the eyes large and black; the head anteriorly, the mandibles, and basal half of the antennæ, pale ferruginous; covered very thinly with grey pile and with a few erect whitish hairs on the face and vertex. Thorax darkest above, and with a pile and pubescence similar to that on the head; the legs rufo-piceous above. Abdomen obscure rufo-fuscous, covered with a grey pile and having a few scattered erect hairs; the first node clavate, the second wider and subglobose.

Hab.—Mexico.

53. *Pseudomyrma volatilis.*

Male.—Length 4 lines. Rufo-testaceous, with the thorax black above. Head transverse, narrowed behind, with the eyes large and prominent; the head, basal joint of the antennæ in front, and the mandibles, pale rufo-testaceous, with the vertex black. Thorax palest beneath, with the mesothorax and scutellum black; wings sub-

Digitized by Google

hyaline and iridescent, the nervures testaceous, the stigma large and black. The two nodes of the abdomen elongate and petiolated, the basal one longest; the abdomen oblong and shining.

Hab.—Mexico.

54. *Pseudomyrma rufomedia.*

Female.—Length 4¾ lines. Head and abdomen black; thorax ferruginous. Head oblong, slightly narrowed anteriorly and posteriorly, semi-opaque, with longitudinal irregular striation; eyes oblong-ovate; the mandibles rufo-piceous. Thorax flattened at the sides; the mesothorax and scutellum black; wings hyaline, the nervures testaceous, the stigma fuscous; legs black, with the apical joints of the tarsi rufo-testaceous, as well as the trochanters of the intermediate and posterior legs. The first node of the abdomen ferruginous, compressed, and arched above; the second node and the abdomen shining black, with a thin hoary pile and a few pale hairs towards the apex.

Hab.—Guatemala. Type in British Museum.

55. *Pseudomyrma canescens.*

Female.—Length 4½ lines. Black, and densely covered with a fine hoary pile. Head oblong, widest anteriorly; eyes large and oblong-ovate, anterior margin of the head, before the insertion of the antennæ, and the mandibles, pale yellow. Thorax: the anterior tibiæ and tarsi, and the tips of the femora, yellow; the intermediate tibiæ behind, also the apex of the femora and the posterior tibiæ behind, obscurely pale testaceous; the wings hyaline, the nervures testaceous. Abdomen: the first node clavate, narrowed into a petiole at the base; the second node subglobose.

Hab.—Abydos (Brazil). Type in British Museum.

56. *Pseudomyrma penetrator.*

Female.—Length 4¼ lines. Rufo-fulvous; head oblong, slightly narrowed anteriorly, with the sides nearly parallel, smooth and shining; a black spot between the ocelli. Thorax oblong-ovate, shining; the scutellum and disk of the mesothorax slightly rufo-fuscous, the femora also darker than the tibiæ and tarsi; wings subhyaline, the anterior pair slightly clouded at their apex, the nervures

Digitized by Google

ferruginous, the stigma fuscous. Abdomen darker than the head and thorax; the first node with a short stout petiole, the apex swollen; the second wider and subglobose; the apex pointed; the margin of the second segment narrowly pale ferruginous.

Hab.—St. Paulo (Brazil). Type in British Museum.

57. *Pseudomyrma sedula.*

Male.—Length 5 lines. Dark fusco-ferruginous; the head beneath, the face, mandibles, and basal joint of the antennæ, yellowish-white; the sides of the thorax, beneath, and also the legs of the same colour; wings hyaline and brightly iridescent, the nervures rufo-testaceous, the stigma fuscous. Abdomen elongate, the first node petiolate, swollen at its apex; the second somewhat pear-shaped; the abdomen covered with a fine white sericeous pile; beneath yellow-testaceous.

Hab.—St. Paulo (Brazil). Type in British Museum.

58. *Pseudomyrma flavicornis.*

Worker.—Length 3 lines. Head black, thorax and abdomen rufo-fuscous; the antennæ, mandibles and tarsi reddish-yellow. Head oblong, narrowed anteriorly and posteriorly; eyes large and oblong-ovate. The thorax strangulated in the middle; the sutures, and the sides of the thorax redder than the disk; the metathorax obliquely rounded to its apex; the articulations of the legs reddish. The first node of the abdomen with a short pale ferruginous petiole, the node subglobose; the second node larger and subglobose; the apex of the abdomen pointed and pale ferruginous.

Hab.—Nicaragua.

59. *Pseudomyrma elongata.*

Worker.—Length $2\frac{3}{4}$ lines. Pale ferruginous and slightly shining; head large, much wider than the thorax or abdomen, oblong, narrowed anteriorly and posteriorly; eyes large, oblong-ovate and black. Thorax narrow, elongate, strangulated in the middle, rounded at its anterior and posterior margins. Abdomen: the first node petiolated, clavate; the second subovate; the first segment with a dusky lateral spot at the basal margin; the two following segments dusky at their basal margins.

Hab.—Mexico.

Digitized by Google

60. *Pseudomyrma unicolor.*

Worker.—Length 3—3¼ lines. Luteous and shining; head oblong, widest in front; eyes moderately large, black and oblong-ovate; mandibles paler than the head. Thorax much narrower than the head, slightly strangulated in the middle; the apex of the metathorax obliquely curved to the petiole of the abdomen, which is short, the node being clavate; the second node short and subglobose; the abdomen oblong, and pointed at the apex.

Hab.—Brazil.

This species resembles *P. ligniseca*, of Brazil, but it differs from that insect in having the basal node of the abdomen very short and stout.

Genus TETRAPONERA.

Tetraponera, Smith, Ann. & Mag. Nat. Hist. ix. 44 (1852).

Sima, Roger, Berl. Ent. Zeitschr. p. 178 (1862).

Head longitudinally quadrangular, sides parallel, obtuse anteriorly; ocelli three in male and female, obliterated in the worker; eyes ovate, occupying about one-third of the length of the head; antennæ 12-jointed, clavate, inserted at the sides of an elevated prominence above the base of the clypeus; mandibles stout and dentate. Thorax elongate. Abdomen petiolated and bi-nodose. Wings as in the genus *Pseudomyrma*.

*1. *Tetraponera atrata*, Smith, Ann. & Mag. Nat. Hist. (1852), ix. p. 44, fig. ♀.
Hab.—Bombay.

2. *Tetraponera rufonigra* (*Pseudomyrma*), Smith, Cat. Hym. Ins. Form. 159.
Eciton rufonigrum, Jerdon, Madr. Journ. Lit. & Sc. (1851), p. 111, ☿.
Sima rufonigra, Roger, Berl. Ent. Zeitschr. (1863), p. 25.
Hab.—Malabar; Calcutta; Siam.

3. *Tetraponera nigra* (*Pseudomyrma*), Smith, Cat. Hym. Ins. Form. 159.
Eciton nigrum, Jerdon, Madr. Journ. Lit. & Sc. (1851), 112, ☿.

Digitized by Google

Sima nigra, Roger, Berl. Ent. Zeitschr. (1863), p. 25.
Hab.—Malabar.

*4. *Tetraponera allaborans* (*Pseudomyrma*), Walk. Ann. & Mag. Nat. Hist. (1859), iv. 375, ♂, ♀, ☿.
Sima compressa, Roger, Berl. Ent. Zeitschr. (1863), p. 179.

Note.—Dr. Roger sent me a specimen of his insect, which, on comparison with Walker's types, in the British Museum, proves to be the same species; but his description is so brief and uncharacteristic that no one could possibly have identified them; Dr. Roger's description is excellent, and in every way satisfactory. I give a description of the type in the British Museum.

*5. *Tetraponera testacea*, Smith, Ann. & Mag. Nat. Hist. (1852), ix. 45, ♀.
Hab.—Napo, S. America.

6. *Tetraponera carbonaria*, Smith, Journ. Proc. Linn. Soc. Zool. (1864), vii. 20, ☿.
Hab.—Bouru; India; Ceylon; Aru.

7. *Tetraponera læviceps* (*Pseudomyrma*), Smith, Journ. Proc. Linn. Soc. (1864), viii. 145, ☿.
Hab.—Ceram; Dory; Aru; Waigiou.

*8. *Tetraponera concolor* (*Pseudomyrma*), Smith, Journ. Ent. (1860), p. 70, ♀.
Hab.—St. Paulo, Brazil.

*9. *Tetraponera natalensis* (*Pseudomyrma*), Smith, Cat. Hym. Ins. Form. p. 160, ♀.
Hab.—Natal.

Tetraponera allaborans, Walk. Female.—Length 3 lines. Black, smooth and shining; head oblong, the sides parallel, the anterior portion, before the insertion of the antennæ, as well as the mandibles, ferruginous; the antennæ pale rufo-testaceous; the legs are of the same colour, but the femora are somewhat darker, particularly the hinder pair, which are fusco-ferruginous. Thorax elongate and impunctate. Abdomen oblong; the petiole as long as the first node, which is narrower than the second, both being subglobose.

Digitized by Google

Worker.—Length 2 lines. Resembles the female in colouration, the thorax being compressed posteriorly, the abdomen not so deep a black; in some examples fusco-ferruginous, with the margins of the segments paler.

Male.—Length 2 lines. Head orbiculate, black and shining, with the anterior portion, the mandibles and antennæ pale rufo-testaceous. The thorax and abdomen obscure rufo-ferruginous and shining; legs rufo-testaceous; wings subhyaline, the nervures pale fuscous; abdomen one-third longer than the head and thorax; the first node of the peduncle, which is very short, subglobose; the second twice the size of the first, and only a little narrower than the first segment; the basal margins of all the segments testaceous.

The descriptions are made from the typical specimens, from Ceylon, Mr. Walker's being too brief, in my opinion, for the separation of the species from others closely resembling *Sima allaborans*.

10. *Tetraponera petiolata*.

Female.—Length 4¼ lines. Black and shining; the head and thorax with fine distant punctures. The scape and first joint of the flagellum ferruginous. Thorax oblong; the prothorax rounded in front, with the sides parallel; the meso- and meta-thorax combined of an oblong-ovate form; the legs slender, with the claws of the tarsi and the calcariæ pale rufo-testaceous. The petiole of the abdomen as long as the first node, which is oblong-ovate; the second node larger and subglobose; the abdomen as long as the head and thorax, and of about the same width as the latter, and covered thinly with fine hoary pile.

Worker.—Length 3¼ lines. Only differs from the female in being deeply constricted between the meso- and meta-thorax.

Male.—The size of the worker. Shining-black, narrow and elongate. The head much narrowed behind the eyes, which are large and prominent; the ocelli pale and placed in a triangle on the vertex, the anterior ocellus opposite the vertex of the eyes; the antennæ and tips of the mandibles rufo-testaceous; the head and cheeks with long pubescence, also a little on the vertex. Thorax rather more than twice the length of the head, but narrower; the tibiæ, tarsi and trochanters pale rufo-testaceous; the

Digitized by Google

femora fusco-ferruginous; wings subhyaline. Abdomen: the petiole and first node elongate-clavate; the second node also petiolated but shorter, and the node wider; the abdomen elongate-ovate, with a little fine, thin, pale pubescence at the apex.

Hab.—Ceylon.

This is very distinct from the *T. compressa* of Roger, also from Ceylon; that species has the legs pale ferruginous, as well as the antennæ, and it has the metathorax compressed and more elevated than the prothorax.

Type of female in the British Museum.

11. *Tetraponera attenuata.*

Worker.—Length 3¼ lines. Black and shining; the head narrowed behind the eyes and rounded; the scape, and one or two of the basal joints of the flagellum, pale ferruginous; the sides of the head and the cheeks with hoary pile. Thorax oblong and narrow, much constricted in the middle; the metathorax elevated and subglobose; the legs slender and elongate, with the trochanters rufo-testaceous. The petiole of the abdomen long and slender, the first node narrow, oblong and rounded above; the second node with a short petiole and twice the width of the first; the abdomen oblong, pointed at the apex. The thorax and abdomen with thin hoary pile.

Hab.—Sarawak.

12. *Tetraponera Æthiops.*

Worker.—Length 5½ lines. Black and shining; the head and thorax finely punctured; the nodes of the petiole also punctured, the abdomen very delicately so; the base and apex of the scape rufo-piceous, and the apical joint of the flagellum pale rufo-testaceous. The anterior and intermediate tibiæ and tarsi rufo-piceous, the former more or less obscurely so; the calcariæ pale testaceous; the anterior margin of the thorax slightly rounded, with the lateral angles rather prominent; from these to the base of the mesothorax the sides are narrowed, the metathorax being slightly widened to its apex, which is obtuse. The petiole of the abdomen short, the nodes globose; the second full one-third wider than the first, and having a few pale setæ at its hinder margin; the abdomen oblong, pointed at its apex, and having a few

Digitized by Google

scattered pale setæ; the entire insect has a thin, fine, hoary pile.

Hab.—S. Africa.

This species is about the same size as *T. rufonigra*, but it differs in the form of the abdomen being more elongate and its nodes more globose.

13. *Tetraponera punctulata.*

Female.—Length 3⅓ lines. Jet black and shining; the head and thorax very finely punctured, the abdomen very delicately so. The antennæ, mandibles, tibiæ and tarsi light ferruginous. Head elongate-quadrate, with an impressed fovea on the front between the eyes; the prothorax rounded anteriorly, from hence to the metathorax gradually narrowed, the latter truncate posteriorly with the margins rounded, not elevated above the prothorax; the petiole of the first node of the abdomen short, scarcely half the length of the node, which is, as well as the second node, subglobose; the second broader than the first node. Abdomen oblong.

Hab.—Champion Bay, W. Australia.

This species most closely resembles *Tetraponera lævicеps*, but that species has the metathorax elevated higher than the prothorax. The punctula are to be seen only by the aid of a moderately strong pocket lens.

Type in the British Museum.

Digitized by Google

VI. *A Monograph of the Australian species of the Coleopterous family* Lycidæ. By Chas. O. Waterhouse.

[Read 4th April, 1877.]

The numerous species of the family *Lycidæ* added to the National Collection during the last few years have obliged me to make a somewhat detailed examination of the group. The present paper is the result of my study, so far as the Australian species are concerned. The number of species at present recorded from that continent is 14; to these 24 new species are now added, making a total of 38, but of the described species seven are unknown to me.

List of Species.

Porrostoma erythropterum, Er.
" rufipenne, Fabr.
" brevirostre, sp. n.
" laterale, Redt.
" abdominale, sp. n.
" elegans, sp. n.
" uniforme, sp. n.
" irregulare, sp. n.
" textile, sp. n.
" russatum, sp. n.
" apicale, sp. n.
" lineatum, sp. n.
" togatum, sp. n.
" scalare, sp. n.
" fallax, sp. n.
" salebrosum, sp. n.
Porrostoma hæmorrhoidale, sp. n.
" plagiatum, sp. n.
" lugubre, sp. n.
" cinctum, sp. n.
" clientulum, sp. n.
" inquinulum, sp. n.
" dichroum, sp. n.
" limbatum, sp. n.
Trichalus flavopictus, sp. n.
" discoideus, Er.
" ampliatus, sp. n.
" sulcatus, sp. n.
" serraticornis, Fabr.
Calochromus scutellaris, Er.
" Guérinii, MacLeay.

Porrostoma, Casteln. 1836.

The following descriptions will, I think, be sufficient to show that the length of the rostrum in these insects is not of generic importance, and that therefore the genus *Metriorrhynchus* (Guérin, 1838) cannot stand. All the species have the costa of the elytra next the suture not branching at the base, but parallel with the suture.

* *Thorax divided into seven areolets.*

All the males of the species of this section (so far as they are known to me) have the penultimate segment of the abdomen divided in the middle nearly to the base by a parallel-sided incision. (Pl. I. fig. 5.)

Digitized by Google

P. erythropterum, Er.

Very close to *P. rufipennis*, F., but separated on account of the long cylindrical rostrum, flabellate antennæ in the male, &c. (Pl. I. figs. 1—5.)

P. rufipenne, F.

Generally rather smaller than the preceding species. The form of the thorax varies very much. The length of the rostrum appears also to vary, and the punctuation is more distinct in some examples than in others. (Pl. I. figs. 6—9.)

A single example from N.W. coast has the thorax very broad, and the rostrum long and cylindrical and very shining. I suppose it to be a mere variety. (Pl. I. figs. 10—12.)

P. brevirostre, sp. n. (Pl. I. figs. 13—14.)

Nigrum; elytris rufis; rostro latitudine vix longiore. ♂.

Long. 6 lin.

Separated from *P. rufipenne* on account of the very short rostrum, which is scarcely longer than broad, very finely and thickly punctured.

Hab.—N.W. Coast of Australia. Brit. Mus.

P. laterale, Redt. sp. n. (Pl. I. fig. 15—17.)

Nigrum, opacum, thoracis lateribus elytrisque rufo-flavis; rostro cylindrico, nitido, basi subtilissime punctulato; antennis articulis 6—10 apice truncatis; thorace haud profunde 7-areolato; elytris quadricostatis, interstitiis irregulariter biseriatim foveatis. ♀.

Long. 4½ lin.

Closely allied to *P. erythropterum*, Er. Rostrum very long, cylindrical, a trifle narrowed before the base; 3rd joint of the antennæ not quite as long as the two following joints taken together; the 4th and 5th obliquely truncate (or slightly emarginate) at the apex; the 6th to 10th truncate; all the joints very compressed, simple and not distinctly narrowed at their base. Thorax narrowed and rounded in front, the sides regularly arcuate, the base strongly bisinuate; above divided by ridges into seven areolets, the ridges dividing the lateral areolets very obsolete. Scutellum black, emarginate at the apex. Elytra parallel, each with four costæ, the interstices with double

Digitized by Google

rows of foveæ, less distinct than in *P. rufipenne*, the rows not divided by a costa.

Hab.—Sydney. Brit. Mus.

Note.—I presume this species to be *P. laterale*, of Redtenbacher.

P. abdominale, sp. n. (Pl. I. figs. 19—22.)

Nigrum; thoracis lateribus, elytris (apice excepto), coxis, femoribus basi, abdominis marginibus flavo-rufis; rostro elongato, sat acuminato, subtilissime punctulato, apice emarginato; labro antice arcuatim angustato; antennis latis; thorace septem-areolato, postice medio nigro; elytris quadricostatis, interstitiis regulariter biseriatim foveatis, apice nigris. ♂.

Long. $6\frac{3}{4}$ lin.

Head black; rostrum nearly a line in length, broad at the base, narrowed towards the apex, closely and very finely punctured (or rather scratched), deeply impressed on each side in front of the eyes, with a small impression also in front at the base close to the antennæ; labrum distinctly longer than broad, arcuate at the sides, narrowed in front, finely and moderately thickly punctured. Antennæ broad, opaque, scarcely more than half the length of the elytra; 3rd joint about $\frac{1}{3}$ longer than its greatest breadth, very little narrowed at the base, the lower anterior angle produced at right angles with the axis of the joint, the produced part one-third the length of the entire joint, obtuse at its apex; the 4th to 8th joints shorter but of the same form, the 9th and 10th a trifle longer, and having the produced part less at right angles to the axis. Thorax deeply bisinuate at the base, a little narrowed in front, arched at the sides anteriorly. The coxæ, the femora (except at the apex), the sides of the first six abdominal segments and the apical segments entirely orange-red.

Hab.—East Australia. Brit. Mus.

P. elegans, sp. n. (Pl. I. figs. 23—27.)

Nigrum; thorace elytrisque ferrugineo-rufis, illo areolis posterioribus in parte nigris; scutello nigro; elytris parallelis, quadricostatis (basi fere octo-costatis), interstitiis regulariter biseriatim foveatis. ♂, ♀.

Long. 6 lin.

Rostrum one line in length, shining, thick at the base, narrowed at the apex, impressed at the sides, with a small

Digitized by Google

elongate puncture in front near the base, gently emarginate at the apex, finely and closely punctured at the base, sparingly punctured towards the apex; labrum rather elongate, acuminate in front, distinctly and moderately thickly punctured; mandibles pitchy. Antennæ two-thirds the length of the elytra, moderately stout. Thorax with the areolets well defined, the central posterior one black anteriorly, the two lateral posterior areolets marked with black internally. Elytra nearly parallel, each with four costæ, the interstices with regular double rows of foveæ, the rows divided by a fine but distinct costa.

Hab.—Rockhampton, Clarence River, &c. Brit. Mus.

P. uniforme, sp. n. (Pl. I. figs. 28—31.)

Nigrum; thorace, scutello, elytrisque ferrugineo-rufis; rostro minus elongato, crebre subtiliter punctulato, subopaco, apice emarginato; mandibulis piceis; thorace septem-areolato, lateribus sinuatis; elytris quadricostatis, subparallelis, interstitiis irregulariter biseriatim foveatis. ♂.

Long. 4¾ lin.

Rostrum scarcely more than half a line in length, thick at the base, a little narrowed towards the apex, relatively shorter than in the preceding species, but of the same form, gently emarginate at the apex; labrum transverse, very slightly emarginate in front, and pubescent. Antennæ two-thirds the length of the elytra; 3rd joint slightly pitchy along the upper edge, the lower anterior angle produced, the produced part very short and oblique to the axis of the joint. Thorax strongly sinuate at the sides. Elytra quadricostate, the interstices with irregular double rows of foveæ, the rows not divided by a distinct costa.

Hab.—Port Bowen. Brit. Mus.

P. irregulare, sp. n. (Pl. I. figs. 18—18a.)

Nigrum; antennis simplicibus; thorace rufo-flavo, medio nigro; scutello nigro; elytris rufo-flavis, quadricostatis, interstitiis biseriatim punctatis. ♂.

Long. 3 lin.

Rostrum a little longer than broad. Antennæ simple, not dentate, the third joint one-third longer than the following, its upper margin pale, the joints scarcely obliquely truncate at their apex; the lower angle slightly less than

Digitized by Google

a right angle, but not produced. Thorax yellowish, black in the middle. Elytra quadricostate, that next the suture obsolete posteriorly; the interstices with two irregular lines of punctures, the lines not separated by a costa.

Hab.—E. Australia, Mackenzie River. Brit. Mus.

P. textile, sp. n. (Pl. I. figs. 32—35.)

Nigrum, latior; thorace, scutello, elytrisque læte flavo-rufis. ♀.

Long. 7 lin.

Rostrum rather long, shining, very sparingly punctured in front. Antennæ long and broad, not diminishing towards the apex; each joint with a carina parallel with the lower margin. Thorax broad, narrowed in front. Elytra quadricostate, the interstices with two regular rows of foveæ, the rows divided with a distinct carina.

Hab.—Moreton Bay. Brit. Mus.

P. russatum, sp. n. (Pl. I. figs. 36—38.)

Nigrum; thorace, scutello, elytris (apice excepto), coxis, femoribusque basi, flavo-rufis; rostro piceo, nitido; elytris quadricostatis, subparallelis, interstitiis biseriatim foveatis. ♀.

Long. 6 lin.

Very close to *P. apicale*, but differs, besides in the coloration, in having the antennæ a little broader; the 9th and 10th joints are not transverse. The rostrum is very smooth, only punctured at the sides and at the base. The four anterior femora are tipped with black; the posterior pair are black, except at the extreme base. The middle posterior areolet of the thorax is black anteriorly. The sculpture of the elytra is more regular and distinct; two of the costæ are very strong at the base.

Hab.—Port Bowen. Brit. Mus.

P. apicale, sp. n. (Pl. I. figs. 39—44.)

Flavo-rufum, angustior; antennis, tarsis, abdomine, elytrorumque apice nigris. ♂.

Long. 5 lin.

Head yellowish-red, shining; rostrum ¾ lin. in length, moderately broad at the base, narrowed at the apex; labrum and palpi pitchy, the former longer than broad, acuminate at the apex; eyes prominent, black. Antennæ

Digitized by Google

about $\frac{2}{3}$ the length of the elytra, black, except the basal joint, which is pitchy; third joint three times the length of its greatest width, the lower anterior angle produced, the produced part $\frac{1}{8}$ the length of the entire joint, the fourth to tenth joints gradually increasing in length, but all shorter than the third, distinctly and regularly narrowed to their bases. Thorax a little narrowed and rounded in front, the sides a little sinuous, the dorsal ridges well marked, dividing the surface into seven areolets. Elytra parallel, very long, tipped with black, quadricostate, the interstices with two rows of transverse foveæ, the rows divided by a fine carina. The apical half of the posterior tibiæ, the tarsi and abdomen black.

Hab.—Cape York. Brit. Mus.

Var. Posterior tibiæ entirely yellowish-red.

Hab.—Port Essington. Brit. Mus.

P. lineatum, sp. n. (Pl. I. figs. 45—48.)

Fusco-nigrum; thorace limbo, elytrisque obscure flavis, his quadricostatis, interstitiis infuscatis, biseriatim foveatis; rostro latitudine breviore, ♀.

Long. 6 lin.

At once distinguished from all the preceding by the very short muzzle. Thorax blackish, with the lateral and anterior margins yellowish. Elytra quadricostate, the interstices with a double series of square punctures, the rows not distinctly divided by a ridge.

Hab.—N. W. Australia. Brit. Mus.

A second specimen from V. D. Land (Hobart Town) has the thorax rather narrower.

P. togatum, sp. n. (Pl. I. figs. 49—52.)

Nigrum; elytris elongatis, flavo-rufis, apice nigro, quadricostatis, interstitiis biseriatim punctatis; rostro latitudine paulo breviore, medio canaliculato, utrinque foveâ magnâ nitidâ. ♂.

Long. 5 lin.

The rostrum is scarcely as long as broad, narrowed towards the apex, very thickly and extremely finely punctured. The elytra are dull yellowish-red, with the apex black, the black more advanced on the suture than at the sides. Each has four costæ, the interstices with two rows of square punctures, the rows not distinctly divided by a costa.

Hab.—N. W. Australia. Brit. Mus.

Digitized by Google

P. scalare, sp. n. (Pl. I. figs. 53—56.)

Atrum; elytris apice sordide flavo; rostro latitudine breviore; elytris quadricostatis, interstitiis reticulatis. ♀.

Long. $4\frac{1}{2}$ lin.

The elytra have each four costæ, the interstices are rather strongly reticulate.

Hab.—N. W. Australia. Brit. Mus.

P. fallax, sp. n. (Pl. I. figs. 57—60.)

Elongatum, parallelum, nigrum; thorace elytrisque flavo-rufis, his apice nigro; rostro latitudine paulo breviore, opaco, utrinque foveâ nitidâ; elytris thorace quinquies longioribus, sat convexis, parallelis, quadricostatis, interstitiis biseriatim punctatis. ♀.

Long. $6\frac{1}{2}$ lin.

Elytra about five times as long as the thorax, black at the apex, quadricostate, the interstices with two regular rows of square punctures, the rows divided by a fine costa.

Hab.—Moreton Bay. Brit. Mus.

P. salebrosum, sp. n. (Pl. II. figs. 61—64.)

Statura et color *P. rufipennis*, at minor, rostro brevissimo. Niger, elytris rubris, quadricostatis, interstitiis biseriatim punctatis. ♂, ♀.

Long. 4 lin.

Differs from *P. rufipenne* in having the rostrum very short, with a deep fovea in front of each eye. Third joint of the antennæ as broad as long. Elytra red, quadricostate; the interstices with two rows of punctures, the rows separated only at the base of the elytra by an obscure costa.

The female differs from the male in having the antennæ a little less strongly dentate.

Hab.—Melbourne and V. D. Land. Brit. Mus.

P. hæmorrhoidale, sp. n. (Pl. II. figs. 61a—64a.)

Elongatus, parallelus, niger; elytrorum apice rufo; elytris quadricostatis, interstitiis biseriatim cancellato-punctatis. ♂, ♀.

Long. $4\frac{3}{4}$ lin.

Dull black. Rostrum shorter than broad. Thorax small, divided above into seven areolets. Elytra with four

Digitized by Google

distinct costæ; the interstices with two rows of large irregular punctures, the rows not divided by a distinct costa; the apices are red.

Hab.—Van Diemen's Land. Brit. Mus.

This species resembles *P. scalaris*, but is much longer and narrower, and the rows of punctures on the interstices of the elytra are much more regular.

P. plagiatum, sp. n. (Pl. II. figs. 65—68.)

Atrum; elytris marginibus apiceque rubris; rostro latitudine breviori, utrinque impresso; antennis bene dentatis. ♂.

Long. 4¾ lin.

Rostrum very short, shorter than broad, compressed in front, with a deep impression in front of the eye. Elytra deep red, with a black patch extending from the scutellum to the posterior two-thirds, somewhat in the form of an Λ; quadricostate; the interstices with two rows of punctures, not separated distinctly by a carina.

Hab.—E. Australia. Brit. Mus.

P. lugubre, sp. n. (Pl. II. figs. 69—72.)

Atrum; rostro nullo, clypeo leviter emarginato; elytris postice paulo ampliatis, quadricostatis, interstitiis biseriatim foveolatis, suturâ marginibusque tenuiter ferrugineis. ♂.

Long. 5 lin.

Dull black above; rostrum none; elytra with the suture and the entire margins narrowly bordered with rusty yellow.

Hab.—Australia. Brit. Mus.

P. cinctum, sp. n. (Pl. II. figs. 73—77.)

Nigrum; thorace rufo, medio nigro, ruguloso, vix septem-areolato, areolâ discoidali solum bene determinatâ; scutello rufo; elytris rufis, apice nigris, novem-costatis, costis alternis minus elevatis, interstitiis regulariter uniseriatim fortiter punctatis. ♂, ♀.

Long. 4 lin.

The antennæ of the male are very strongly dentate. The mandibles are reddish. The thorax is divided into seven areolets, but the lines dividing them are very in-

Digitized by Google

distinct, except those enclosing the central posterior areole. The coxæ and the extreme base of the four anterior femora are reddish.

Hab.—Queensland and Brisbane. Brit. Mus.

** *Thorax divided into five areolets.*

P. clientulum, sp. n. (Pl. II. figs. 78—81.)

Atrum; rostro nullo; palpis basi obscure testaceis; thorace quinque-areolato; elytris obscure flavis, apice nigro. ♀.

Long. 4 lin.

Elytra rather short, dull yellow, with the apex black, the black part not advanced on the suture; each elytron with four costæ, the second only well defined and extending to the apex, the others less distinct; interstices rather irregularly but moderately strongly punctured.

Hab.—Moreton Bay. Brit. Mus.

*** *Thorax with the central areolet only well defined.*

P. inquinulum, sp. n. (Pl. II. figs. 82—86.)

Atrum; elytris margine anguste apiceque late ferrugineis; rostro fere nullo; thorace concavo, lateribus reflexis, disco areolâ lanceolatâ instructo; elytris quadricostatis biseriatim reticulato-punctatis. ♂, ♀.

Long. 5—5¾ lin.

The costæ of the elytra are distinct to the apex; the interstices have two rows of square punctures, the rows not distinctly divided by a carina. The male has the penultimate segment incised as in the first section.

Hab.—Australia. Brit. Mus.

P. limbatum, sp. n. (Pl. II. figs. 88—91.)

Atratum; thoracis elytrorumque marginibus flavis; rostro nullo; thorace vix quinque-areolato, areolâ discoidali solum bene determinatâ; elytris postice paulo ampliatis, quadricostatis, interstitiis transversim reticulatis, apice arcuatim rotundato. ♂.

Long. 3½ lin.

Blackish; base of the 3rd antennal joint, base of the palpi, base of the femora, and coxæ obscure testaceous. Thorax with the central areole only well defined. Elytra

Digitized by Google

quadricostate, the 2nd and 4th costæ more distinct, but none reaching to the apex, the interstices with very numerous transverse ridges (as in *Eros minutus*). Penultimate segment of the abdomen with a deep semicircular emargination. (Pl. II. fig. 91.)

Hab.—Australia. Brit. Mus.

Note.—This species differs much in appearance from all the preceding, owing to the elytra being narrowed towards the base, and the apex of each elytron is rounded.

Trichalus, gen. nov.

The following species are separated on account of their having a deep lanceolate impression on the disk of the thorax, and the costa of the elytra next the suture is divided into three branches at the base, so that the other costæ are not parallel to the suture. The rostrum is very short.

T. flavopictus, sp. n. (Pl. II. figs. 92—96.)

Niger; thorace ochraceo, utrinque bi-impresso, disco areolâ lanceolatâ, in imo nigrâ, bene impresso; scutello nigro; elytris postice paulo ampliato, ochraceis, apice nigris, septem-costatis, costis alternis minus elevatis, costâ juxta suturam basi trifidâ, interstitiis reticulato-punctatis; coxis femorumque basi flavis.

Long. 3½—6½ lin.

♂. Antennæ long and broad, 3rd to 10th joints gradually becoming shorter. Thorax reflexed at the sides; the disk raised, and with a deep longitudinal fovea, joined to the front margin by a carina. The penultimate segment of the abdomen is not deeply notched in the middle.

♀. Antennæ less strongly dentate. Thorax straighter at the sides. Elytra a little more parallel. Abdomen simple.

Hab.—Port Bowen. Brit. Mus.

T. discoideus, Er. (Pl. II. figs. 106—108.)

Porrostoma discoideus, Er., Archiv. f. Naturg. 1842, p. 145.

"Niger, thorace 3-areato, elytris rufis, disco nigricantibus, tricostatis, interstitiis bifariam cancellatis."

Long. 4½—5½ lin.

Digitized by Google

This species often has the elytra black, with the extreme margin and the suture only red.

Hab.—Van Diemen's Land (E. D. Atkinson, Esq.). Brit. Mus.

T. ampliatus, sp. n. (Pl. II. figs. 97—101.)

Niger; thoracis lateribus elytrisque rufis; rostro brevissimo; antennis sat longis; thorace lateribus modice reflexis, medio nitido, disco impressione haud profundâ instructo; elytris postice paulo ampliatis, septem-costatis, costis alternis minus elevatis, costâ juxta suturam basi trifidâ. ♂, ♀.

Long. 4½—6 lin.

Antennæ rather long and stout, not much diminishing in width towards the apex. Thorax with the central part black and shining, the sides red and somewhat reflexed. Elytra long and rather wide behind, with seven costæ, three of which are much stronger and more regular than the others; the interstices reticulate-punctate.

The two male examples have the disk of each elytron more or less black; the penultimate segment of the abdomen notched in the middle.

The two females* have the elytra a little less ample, and with less black on the disk. The abdomen simple. The antennæ are less strongly dentate.

Hab.—E. Australia, Moreton Bay. Brit. Mus.

T. sulcatus, sp. n. (Pl. II. figs. 102—105.)

Ochraceus; antennis, tibiis, tarsis, abdomine, elytrorumque apice nigris; rostro fere nullo; thorace quadriimpresso, medio sulcato; elytris septem-costatis, costis alternis minus elevatis, costâ juxta suturam basi trifidâ, interstitiis reticulato-punctatis. ♂, ♀.

Long. 6 lin.

Var. Abdomine in parte antennisque basi flavis.

Head somewhat less engaged in the thorax than in most species of this group; eyes not very large. Antennæ rather long and stout. Thorax moderately reflexed at the sides, with a longitudinal impression reaching nearly from the base to the apex. Scutellum yellow. Elytra with seven distinct costæ, that next the suture divided into three near the base.

* I presume these to be the females of the same species.

Digitized by Google

The antennæ are almost identical in the two sexes; the male has a small notch in the middle of the penultimate abdominal segment.

Hab.—Brisbane, Port Essington. Brit. Mus.

T. serraticornis, Fabr. (Pl. II. figs. 109—112.)

"Niger, thorace elytrisque rufescentibus, elytris apice nigris." "Antennæ valde compressæ, serratæ, nigræ. Thorax rufescens, marginibus subreflexis. Elytra sulcata, sulcis rugosis, rufescentia, apice nigra. Abdomen et pedes nigra. Femora basi testacea." Fabr., Syst. Ent. p. 203.

Long. 3½ lin.

The colour of the thorax and elytra of the type is *now* nearly testaceous. The thorax is strongly punctured in front, and has a strong discoidal impression. The elytra have seven costæ, the alternate ones being rather indistinct and irregular; that next the suture is divided into three near the scutellum. The apex of the elytra and the abdomen are now wanting in the type specimen, which is the only one I have seen.

Hab.—"Nova Hollandia." (Coll. Banks.) Brit. Mus.

CALOCHROMUS, Guérin, 1833.

Anarhynchus, Guérin, 1838.

C. scutellaris, Er. (Pl. II. figs. 113—115.)

Anarhynchus scutellaris, Er.

Blue-black; elytra rusty red, sometimes with the apex black.

Hab.—Swan River and N. W. coast. Brit. Mus.

C. Guérinii, MacLeay.

Blue-black; thorax and elytra yellow, the former sometimes with a black spot on the hind margin, the elytra with the apex black.

Hab.—Rockhampton, Cape York. Brit. Mus.

"*Lycus septemcavus* and *L. rhipidius*," MacLeay.

There is nothing in the descriptions of these species to show how they differ from each other and from *P. rufipenne*, of which I regard them simply as the sexes.

Digitized by Google

Lycus (*Charactus*) *Bremei*, Le Guillou, 1844.

From Hobart Town, and quite distinct from *Lycus Bremei*, Guérin, from Abyssinia. (The two are confounded in the Munich Catalogue.)

Le Guillou's species appears to be *Calochromus scutellaris*, Er., 1842.

The following species, known to me only from description, appear to be distinct from any of the preceding:—

Lycus ochraceus, Dalm., Schönh., Syn. Ins. App. p. 31.

"Subtus ater, supra ochraceus; thoracis disco nigro; elytris striatis, reticulato-punctatis." Long. 6 lin. "Elytra ad scutellum infuscata."

Metr. marginatus, Er., Wieg. Arch. 1842, p. 145.

"Niger, thorace 7-areolato; elytris rufo-marginatis, 4-costatis, interstitiis biseriatim cancellato-punctatis. Long. 4 lin." Van Diemen's Land.

Lycus (*Charactus*) *Goryi*, Le Guillou, Rev. Zool. 1844, p. 222.

"Noir terne, avec les élytres bordées extérieurement de jaune. . . Elytres portant chacune quatre côtes élevées, entre lesquelles il y a une côte moins saillante et des élévations transversales formant une réticulation bien marquée; le jaune des bords part de l'angle huméral, qui est occupé par une tache assez large, suit le bord externe jusqu'à la première côte élevée, arrive à l'extrémité, où il s'élargit, et remonte un peu sur la troisième côte et à la suture. Antennes fortement dentées en scie.

"Long. 10m., l. $2\frac{3}{4}$ mill." Hobart Town.

This may prove to be *M. marginatus*, Er., ante.

Lycus (*Charactus*) *australis*, Boisd. Voy. Ast. ii. p. 119.

"Supra croceus; thorace macula media nigra; elytris subparallelis sulcatis; subtus antennisque nigris."

Metr. femoralis, W. MacL., Trans. Ent. Soc. N. S. W. ii. p. 262.

"Antennæ black. Head small, black. Thorax red, with black centre, divided into seven hollows. Scutellum black. Elytra orange-red, tipped in the female with dark

Digitized by Google

blue, with four fine costæ on each, and with the intervals filled with shallow square punctures disposed in double rows. Body beneath black. Legs black, excepting the coxæ and basal two-thirds of the thighs, which are red." ♂ 5 lin., ♀ 7 lin. [Extract.]

Metr. nigripes, MacL., l. c. p. 262.

"This species differs from the last in having the head only lightly impressed on the median line, and not nitid, in having the thorax more rounded at the posterior angles, and black only on the basal portion of the middle, in having the elytra of a darker red and more deep punctuation, and in having the legs entirely black."

Long. 5 lin.

Metr. marginicollis, MacL., l. c. p. 263.

"Black. Antennæ strongly dentate. Thorax seven-hollowed, with the lateral margins yellowish-red. Elytra yellowish-red, four-costate, with the intervals rather confusedly punctate in double rows, and towards the apex appearing to consist of single rows of transverse punctures. Legs and under surface of body entirely black."

Long. 4 lin.

The following species has just been received; it should be placed next to *P. inquinulum*.

Porrostoma dichroum, sp. n. (Pl. II. figs. 86—87.)

Nigrum, opacum, thorace lato, excavato, triareolato, areolâ medianâ lanceolatâ; elytris sordide flavis, apice nigris, quadricostatis, interstitiis biseriatim punctatis. ♀.

Long. 5 lin.

Thorax broad, sides much reflexed, the central areolet not reaching the anterior margin, but joined to it by a short carina. Elytra parallel, dirty yellow, with the apical third black; each elytron with four strong costæ, the interstices with two regular rows of distinct quadrangular punctures, the rows divided by a very fine ridge. Body beneath shining black; legs dull.

Hab.—King George's Sound. Brit. Mus.

Digitized by Google

VII. *Descriptions of new genera and species of East Indian* Tenthredinidæ. By Peter Cameron.

[Read 4th April, 1877.]

For the examination of the following East Indian *Tenthredinidæ* I am indebted to the kindness of Mr. Moore, of the East Indian Museum, and of Mr. Frederick Smith.

Genus Tenthredo, S. Str.

Tenthredo latifasciata, sp. n.

♀. Black, a thin line on pronotum; cenchri, a large lateral spot extending over the three basal segments of abdomen, and mandibles, white; palpi pale. Legs reddish; coxæ, trochanters, and base of femora, black; posterior tarsi fuscous. Head and thorax covered with a pale pubescence, punctured, smooth, shining, with a few shallow punctures; terebra long, projecting. Antennæ a little longer than abdomen, the 3rd joint not much longer than 4th.

Length 6 lines; alar. exp. 12½ lines.

Hab.—India.

Very similar to *T. atra*, Linné, but that species has the clypeus and labrum white, no white mark on abdomen, and posterior tarsi and apex of tibiæ black.

Tenthredo simulans, sp. n.

♀. Of similar size and colour to the European *T. olivacea*, Klug, but the incision in clypeus is very much shallower, and at the same time broader; the antennæ from 2nd joint quite black, the legs without a black line above, and the abdomen from the 3rd segment at the sides and beneath black. The dorsum of the abdomen is also black, but there is a variety of *T. olivacea* having this peculiarity.

If it were not for the difference in the form of the clypeus, I should have considered this species to be merely a climatic variety of *T. olivacea*.

Hab.—India.

Digitized by Google

Genus Pachyprotasis, Hartig.

Pachyprotasis rapæ, Lin.

Among Mr. Smith's insects there is a *Pachyprotasis* from India which I cannot separate specifically from the common *P. rapæ*, from the ordinary form of which it differs merely in having the posterior calcaria and tarsi black, the abdomen above marked with white at the junction of the segments, and there is only one black mark on the pleuræ and none on the sternum; all these being points in which European specimens of *rapæ* are prone to vary.

Genus Beleses,* Cameron.

Beleses fulvus, sp. n.

♀. Fulvous, pilose; base of alar stigma and mandibles black. Mesonotum finely punctured; pleuræ smooth, shining. Antennæ shorter than abdomen, thick, covered with longish stiff hairs. Wings hyaline, the apical fourth with a faint black cloud; nervures blackish; costa yellow; second recurrrent nervure received a little piece beyond the second submarginal. The basal joint of the tarsus is longer than all the other joints combined.

Length 4¾ lines; alar. exp. 11½ lines.

Hab.—West Yunan (Dr. Anderson).

This species is sufficiently distinguished from *B. stigmaticalis*, Cam., by its entirely fulvous colour and non-interstitiate second recurrent nervure.

Siobla, gen. nov.

Anterior wings with two marginal and four submarginal cellules, the second and third of the latter receiving each a recurrent nervure. Lanceolate cellule with an oblique cross nervure; posterior wings with two middle cellules. Antennæ nine-jointed, the apical joints thickened, the third joint much longer than fourth; clypeus small, the apex

* The generic names *Anisoarthra* and *Anisoneura* (Trans. Ent. Soc. Lond. 1876, Pt. III. pp. 461, 463) being preoccupied, I now propose for them the names of *Senoclia* and *Beleses* respectively. I am told by Mr. F. Smith that the locality for *Senoclia cyanella* (*l. c.* p. 462) is New Guinea, and not Ceylon.—P. C.

Digitized by Google

truncated; eyes large, reaching to near the base of the mandibles.

The genus described here possesses certain characters which separate it from the allied genera of *Tenthredo* and *Macrophya*. It has the four submarginal cellules and the middle cellules in the posterior wings as in *Tenthredo*, but has the lanceolate cellule of *Emphytus*, *i. e.*, having an oblique cross nervure. In the form of the antennæ also it does not differ very much from *Tenthredo*, but the clypeus is truncated at the apex and much smaller than in that genus. *Macrophya Sturmii*, Klug, is stated to have an oblique cross nervure in the lanceolate cellule, thereby differing from the other species in the genus, but in the present genus the coxæ are smaller and the posterior calcaria much shorter than in *Macrophya*, while it is further distinguished from it by the form of the clypeus. The claws are bifid.

Tenthredo incerta, Cam., must be referred to this genus, but I know not if *Macrophya Sturmii* belongs to it, not having a specimen of that species to examine.

Siobla Mooreana, sp. n.

♂. Black, pilose, half shining, punctured; four apical joints of antennæ, clypeus, labrum, palpi, pronotum, scutellum, postscutellum, a thin line across the apex of metanotum, a round point below the tegulæ (which are black), two narrow bands at the base of abdomen, base of coxæ, trochanters, base of femora, four anterior femora at apex, four anterior tibiæ and tarsi, basal half of posterior tibiæ and base of tarsal joints, with the calcaria, white. Mandibles black. Pleuræ opaque, punctured, with a fine pile; front projecting, emarginated. Scutellum raised, smooth, shining. Antennæ pilose at base; second submarginal cellule slightly angled in the middle, where it receives the first recurrent nervure. The abdomen is smooth and shining, and bears shallow punctures.

Length 4¾ lines; alar. exp. 12 lines.

Hab.—W. Yunan (Dr. Anderson).

S. Mooreana is easily known from *S. incerta* by the absence of red coloration on the thorax, the white on the head and apex of antennæ, &c.

Digitized by Google

Genus Athalia, Leach.

Athalia spinarum, Fab. var. *Orientalis*, Cam.

Differs from the European form in having the costa at base, the basal joints of antennæ and the epistoma luteous, the thorax black only behind the scutellum; there being also a luteous mark on the metanotum, and the wings are not yellowish.

Hab.—India.

Bearing in mind that a somewhat similar form occurs in Japan, differing only in having more black on the thorax (the black colour extending to the mesonotum), I do not feel myself justified in giving specific rank to this variety, more especially as all the species are more or less variable.

Genus Hylotoma, Latr.

Hylotoma excisa, sp. n.

♀. Deep bluish-black, shining, with shallow punctures and a short pale pile. Pro- and meso-thorax with the scutellum ferruginous; the sternum bluish-black. Wings deeply smoky, slightly paler at the apex. Blotch large; anus incised as in *H. berberidis*. The antennæ and feet have not the bluish tinge observable on the abdomen.

Length 4½ lines; alar. exp. 10 lines.

Hab.—Penang.

Similar to *H. captiva*, Sm., but differs in its bluish-black colour and darker wings.

Hylotoma bipunctata, sp. n.

♀. Luteous, shining, covered with a pale pubescence, and very finely punctured. Head, antennæ, four anterior legs, base and apex of four posterior femora, and posterior tibiæ and tarsi, dull black, with a bluish tinge, and a line of black dots on back of abdomen. Above the clypeus are two conspicuous punctures. Wings fuscous, paler at the apex; costa and stigma blackish. The metanotum is faintly marked with black.

Length 4 lines; alar. exp. 9½ lines.

Hab.—India.

Comes near to *H. lutea*, Cam., but is easily distinguished by the dark antennæ.

Digitized by Google

Hylotoma interstitialis, sp. n.

♀. Reddish-luteous. Antennæ, head, scutellum, metanotum and sternum, back of abdomen and legs, bluish-black, with a faint purplish tinge. The luteous colour of the abdomen is paler than that of the thorax. Wings smoky, with a purplish tinge, the posterior pair a little paler; costa, stigma and nervures deep black; 2nd recurrent nervure interstitiate.

Length 6 lines; alar. exp. 13 lines.

Hab.—Darjeeling.

Its comparative large size, small head and interstitiate 2nd recurrent nervure form a ready means of separating this species from its allies.

Hylotoma simlaensis, sp. n.

♂. Luteous. Head, antennæ, scutellum, metanotum and sternum bluish-black; apex of tibiæ and joints of tarsi broadly annulated with black. Mesonotum smooth, shining, and finely punctured, with three very faint marks; one in front and one on each side. Wings hyaline, ner vures black, and with a faint cloud below the stigma.

Length 3½ lines; alar. exp. nearly 8 lines.

Hab.—Simla.

Not unlike our *H. rosæ*, but differs in the luteous mesonotum, deep black antennæ, the wings not yellow, and with black nervures.

Hylotoma pagana, Pz.

This species occurs at Penang.

Lophyrus pini, L.

A ♂ *Lophyrus*, with the cocoon from which it was bred from Sahaumopore, N. W. India, appears to be this common species, but some of the males in this genus are not easily identified.

ANCYLONEURA, gen. n.

Antennæ 13-jointed, the two basal joints small, nearly equal, the third nearly as long as the two following; the fourth a very little longer than fifth, the remaining joints becoming gradually smaller and thicker, more closely packed together and covered with a close but not very long pile; the last joint conical. Clypeus semitruncated at apex; labrum large, apex semicircular; palpi very

Digitized by Google

long. Head narrower than the thorax; eyes reaching to the base of the labrum. Scutellum large, orbicular, convex. Legs short, stout; the tibiæ thickened at apex and provided with two short spurs; the basal joint of tarsus is longer than the succeeding four, and slightly thicker; the fifth is as long as the preceding three; the fourth is very small; the second a very little longer than third; the posterior tarsi are shorter than tibiæ; the anterior nearly as long. Wings with one marginal and four submarginal cellules; the first and second submarginal are nearly of equal size; the third is a little longer than second; the fourth as nearly as long as the other three combined, dilated at the apex; the first submarginal nervure is nearly obliterated in the middle; the first recurrent nervure is curved and long, the second much shorter, oblique. Lanceolate cellule contracted; posterior wings with no middle cellule. The costal cellule in the anterior wings has the costa from the stigma to the end of the cellule thickened (I can scarcely say that there is a distinct nervure surrounding it, as in *Brachytoma*); and at the apex of costal cellule in posterior wing there is a small appendicular cellule as in *Hylotoma*.

Belongs to the *Lophyrides*. From *Lophyrus* it is distinguished by the structure of lanceolate cellule and the appendicular cellule in posterior wings. From *Brachytoma* it differs in the characters of the antennal joints and in the appendicular cellule, in posterior wings.

Ancyloneura varipes, sp. n.

♀. Black, shining, covered with a fine whitish down, and with shallow punctures; mandibles piceous; antennæ a little longer than head and thorax. Legs, coxæ, trochanters, two anterior femora (except at apex), apical half of posterior tibiæ and posterior tarsi, black; knees, tibiæ, and four anterior tarsi, sordid white; two posterior femora reddish-testaceous. Wings hyaline at base, dilute fuscous at apex. In second submarginal cellule is a distinct horny point.

Length 4 lines; alar. exp. 6¼ lines.

Hab.—Aru.

I may take this opportunity of stating that I am at present studying the *Tenthredinidæ* and *Cynipidæ* of the Old World. I should feel greatly obliged to any one who could aid me with material.

Digitized by Google

VIII. *The Geographical Distribution of* Danais Archippus. By W. L. Distant.

[Read 7th March, 1877.]

With the exception of *Pyrameis Cardui*, *Danais Archippus* seems soon likely to become the most cosmopolitan of butterflies. It occurs in the New World from Canada to Bolivia and has spread over some of the islands of the Pacific to Queensland and New Guinea. But the great interest which attaches to this insect is, that its dispersion is now taking place over wide areas, almost, we may say, before our eyes; and thus we may not only, by the strict logic of analogy, understand some of the processes by which other butterflies have acquired a wide distribution, but also in this case have an opportunity of watching for local modifications of form and colour, without the species proves to have a more rigid adherence to original type under different conditions than seems to have been the case with other species of the genus. Species to which it is concolorous, as *Plexippus*, *Chrysippus* and *Gilippus*, have allied to them a number of forms, which, though locally constant, are called by some Entomologists species, and by others considered only as varieties, whilst amongst other species of the genus which are associated by a different shade of coloration the same thing equally applies to a number of distinct and equally constant local forms or species approximating more or less to *Aglea* and *Limniace*.

Its sudden appearance in Queensland for the first time and in large numbers was recorded by Mr. Miskin a few years ago,* and we can now also add it to our own fauna, two specimens on good authority having been taken in this country in the autumn of last year—the first on the 6th September, at Neath, S. Wales,† the second at Hayward's Heath on the 17th October,‡ and as we can scarcely believe that English Entomologists are perfectly ubiquitous

* Ent. Mo. Mag. vol. viii. p. 17, 1871.

† Ib. vol. xiii. p. 107.

‡ Entomologist, vol. ix. p. 265. Since this was written a third example has been recorded as taken in Sussex in September last.

Digitized by Google

it is more than probable that many other specimens of *D. Archippus* have reached our shores, though possibly not till and about this time. Whether it becomes a thorough colonist in this country or not, if we examine some of the factors which must necessarily be of the greatest advantage in aiding the wide distribution of *Lepidoptera*, it will be clearly seen that *D. Archippus* is peculiarly favoured and enjoys a preponderance of those conditions which tend to its dispersal and favour its survival.

The causes and conditions which effect and qualify the distribution of *Lepidoptera* have, as regards insects, generally been fully treated by Mr. Wallace, and with his usual appreciation of efficient causes;* and may, perhaps, be summarized as *means of dispersal* and *conditions which are favourable to their survival in a new habitat.*

As regards the "means of dispersal" of this butterfly we need have no recourse to past geological changes, however great a part those depressions and upheavals may have performed in the range of other insects, and we are justified in considering the principal and only factors, as winds, currents, and the agency of man. With the first two means of dispersal is involved a phase of the question which is still of the greatest obscurity, *i. e.*, as to voluntary or involuntary migration. By the term voluntary migration is understood those (to us) apparently purposeless flights of butterflies, often in immense swarms, of which we have had graphic accounts from such travellers as Darwin when as far south on the east coast of S. America as the Bay of San Blas, by Bates and Spruce on the Amazon, by Belt at Nicaragua, by Jones at Bermuda, and numerous other excellent and qualified observers. It is in our present ignorance of the impelling cause of these movements that we give them the name of voluntary in contradistinction to those occasional migrations through the force of gales of wind and like causes, or by the eggs or pupæ being carried on the branches or in the roots of trees, down the length of great rivers or across the sea.

The original habitat of this species is the New World, though whether it first appeared in the Nearctic (as is probable) or Neotropical region, it is not to our present purpose to inquire, and it will be convenient to trace its migration thence in two lines: firstly, eastwards to

* Geo. Dist. of Animals, vol. i. pp. 33, 34.

Digitized by Google

Europe and the Azores, and then westward to the South Sea Isles and Australia.

That the winds alone are a great agency of dispersal with the *Lepidoptera* cannot be doubted with the number of authentic records we have of butterflies and moths being found far at sea and great distances from the nearest land;* and it will readily be understood that butterflies of high and strong flight, especially when at certain seasons they become gregarious, must have a greater chance of being borne on the wings of a strong wind or carried away by a sudden gale than those insects whose flight is low, or whose habits are more solitary and secluded. Now we know that *D. Archippus* has a powerful flight, often sailing with wings expanded high in the air, and was frequently seen by E. Doubleday crossing the Ohio and Mississippi, where those streams were more than a mile in breadth,† and Mr. Gosse, describing the insect in Jamaica as flying low about the logwood hedges, says, "but there are no trees near, or it would probably have towered above them."‡ We also learn from Mr. Riley that the butterfly appears in large bevies or flocks almost every year in some part or other of the west. In September, 1868, accounts were received of their sudden appearance in different parts of the city of Madison, Wisconsin, and at Manteno, Ills.; whilst on the 19th of that month at St. Joseph, Mo., millions of them were seen filling the air to the height of three or four hundred feet, for several hours flying from north to south. In the spring of 1870 a remarkable swarm was seen at Manhattan about the middle of April, and which, as reported by a resident of that place, came rapidly with a strong wind from the N.W., and filled the atmosphere all round for more than an hour, sometimes so as to eclipse the light. Mr. Riley further remarks, "this assembling in large flocks at a considerable height would always be a source of danger to them when overtaken by a gale of wind, when there would be a great probability of their being carried out to sea."§

D. Archippus has likewise a longevity in the imago condition, which would also assist its survival on a long and forced migration, Mr. Mitchell having kept a female alive for forty days. She was kept in an empty wardian case,

* See Müller, Trans. Ent. Soc. 1871.
† Gen. Diurn. Lep. p. 90.
‡ Ann. & Mag. Nat. Hist., Ser. 2, vol. ii. p. 114.
§ Third Ann. Rep. of Ins. of Miss. p. 151.

Digitized by Google

being fed on some weak sugar and water, and Mr. Mitchell thinks she might have lived longer, but that in the meantime he had filled up his case with plants, and as she persisted in keeping near the glass, her wings were continuously drenched by the moisture collected on it.* This butterfly also hybernates, though Mr. Riley remarks whether any but the impregnated females survive until the milk weeds commence to grow is not definitely ascertained.

In the Atlantic Ocean, to the north of the parallel of 35°, there is a very decided prevalence of winds from the westward. In the southern and south-western position of this broad region they blow almost continuously from S.W., or veering from that to W.; and are often found much further south, near the American coast, during the summer months, when southerly and south-westerly winds are common to the coasts of Florida and Georgia.† The most furious gales of wind frequently blow across this region in the same direction. Even gales that take their rise on the coast of Africa, and as far down on that side as the parallels of 10° or 15° N. lat., have, it has been shown by an examination of log-books, made straight for the Gulf Stream: joining it, they have then been known to turn about, and, travelling with it, to reach the shores of Europe.‡ Mr. Packard, jun., has lately drawn attention to the agency of the average direction of the winds in influencing "the migration of the destructive locust of the west."§ Prof. Baird, in his memoir on the distribution and migration of North American birds, has shown a strong analogy to what might have occurred in the case of *D. Archippus*. Most specimens of American birds recorded as found in Europe were taken in England (about fifty out of sixty-nine), and in nearly all cases these specimens belonged to species abundant during summer in New England and the Eastern provinces of British America, and in the great majority of instances their occurrence here has been in the autumnal months. Prof. Baird therefore concludes that the transfer of American birds to Europe is principally, if not entirely, by

* Am. Nat. vol. vi. p. 237.

† This subject has been most exhaustively treated in detail by the late J. H. Coffin, and completed by his son S. J. Coffin and Dr. Woeikof, in Smith. Trans. vol. xx.

‡ Maury, Phys. Geo. of Sea, p. 33.

§ Am. Nat. vol. xi. p. 22.

Digitized by Google

the agency of the winds in seizing them during the period of their migration (the autumnal especially), when they follow the coast, or cross its curves. Carried off, away out to sea, mainly from about the lat. of 45° (the line of greatest intensity of the winds), the first land they can make is that of England, whence the fact, that most of the species have occurred in the British Islands.*

Winds alone can scarcely be considered the only cause of the migration of butterflies over wide areas of sea, though of the highest efficacy for the purpose. When met with far away from land they seem glad to alight on the vessel for rest, and no doubt vast numbers must succumb to the waves; for, apart from the vigour required to sustain such a long flight, the spray in rough weather would sufficiently damp their wings to prevent any onward progress, and very rarely would one be likely to survive the long flight across the breadth of the ocean. That the flight of butterflies is often powerful is sufficiently well known; and Mr. Horne states he has seen them "keep up with an Indian railway train, going at the rate of about twenty-eight miles an hour, with the greatest ease for a considerable time."†

There is still another means of transit between the Nearctic home of *D. Archippus* and these shores. The Gulf Stream, that "river of the ocean," is ever flowing towards us, bearing its flotsam and jetsam of trees, roots and other natural débris. On the northern coast of Spitzbergen has been found "entada gigalobium," a bean of tropical America, discovered also on all the shores washed by the Gulf Stream from Florida to Norway.‡ The drift wood from the West Indian Islands is found in considerable quantity on the south coast of Iceland, where, "on the beach under Snaefell, trees with their roots and scraps of bark, logs of mahogany, and seeds which grow in Jamaica at the nearest, roll in the surf."§ Sir Charles Lyell quotes the instance of a boa constrictor conveyed alive by the current to the island of St. Vincent, twisted round the trunk of a large sound cedar tree.‖ But even to our own shores have arrived at various times the same

---

* Am. Journ. of Science and Arts, Jan. 1865; reprint in Ibis, 1867, p. 257, &c.

† Zoologist, New Ser. p. 1767.

‡ Ripley's and Dana's Am. Cyclopædia, vol. ii. p. 77.

§ Frost and Fire, vol. i. p. 434.

‖ Prin. Geology, vol. ii. p. 369.

Digitized by Google

wanderers. The hawk's-bill turtle (*Chelonia imbricata*), so common in the American seas, has been taken in the Severn, and the leather tortoise (*C. coriacea*) on the coast of Cornwall.* On the shores of the Hebrides have been collected seeds of *Mimosa scandens*, *Dolichos urens*, *Guilandina bondue*, and several other plants of Jamaica, Cuba and the neighbouring continent.† Maury mentions the instance in one year of great numbers of bonita and albercore, *following the Gulf Stream*, having entered the English Channel and alarmed the fishermen of Cornwall and Devon by the havoc which they created among the pilchards there.‡ This extension of the Gulf Stream to our shores in certain years rests on undeniable authority. Sir Edward Sabine drew attention to the mildness of the winter of 1845-46, which was remarkable for its mildness, its heavy rains and floods, and unusual prevalence of its westerly gales, in which it resembled the winter of 1821-22, when the temperature of the sea in the Bay of Biscay was found to be several degrees warmer than usual. The same thing was remarked by Dr. Franklin in the same spot in November, 1776.§ It is a somewhat interesting coincidence that, with our present winter of continuous rains, floods and westerly winds and gales, about the time that *D. Archippus* reached our shores, some other remarkable visitors have been recorded. "*Pyrameis virginiensis*," another American butterfly, at South Devon in September.‖ Flying fish (*Exocœtus evolans*) at the mouth of the Bristol Channel in August,¶ and the bonito (*Scomber pelamys*) at Plymouth in September.**

D. Archippus was recorded from the Azores by Mr. Godman. He met with two specimens of the insect there, though he did not capture either himself. One was taken at Flores in 1864, the other at Fayal in the same year. Both were females. Mr. Godman did not consider the insect as established in the Azores, though as he states "the fact of its having been obtained from two islands so widely separated is a curious coincidence."

---

* Prin. Geology, vol. ii. p. 369.
† Humboldt, Per. Narr., Bohn's Eng. ed. vol. i. p. 22. See also Pennant's Voyage to the Hebrides.
‡ Phys. Geo. of Sea, p. 28.
§ Lon., Ed. and Dub. Phil. Mag. vol. xxviii. p. 317.
‖ Entomologist, vol. ix. p. 255.
¶ Zoologist, vol. xi. p. 5128.
** Ib. 3rd Ser. vol. i. p. 27.

Digitized by Google

He, however, met with no one who knew the insect or had seen it before.*

The fauna and flora of the Azores have a great preponderance of the European element, but still have a few American emigrants, amongst which beetles are well represented. Two Elaters, "*Œolus melliculus*" and "*Monocrepidius posticus*," both colonists from the South American coast, and *Tæniotes scalaris*, a longicorn.† These insects probably pass their larval stage in timber, and so the Gulf Stream, which continuously breaks on the shores of the Azores, is probably the cause of their introduction. Many and various are the flotsam and jetsam which have been conveyed by these means to those shores, some of which are said to have quickened the mind of Columbus as to the existence of unknown western regions. Westerly winds are here also the prevalent ones, winds and currents as usual going together.

Winds and currents are also to be relied on in the dispersal of *D. Archippus* to the South Sea Isles and Australia. The equatorial current flows nearly across the whole breadth of the Pacific, until, as Mr. Laughton observes, "it feels the pressure of the islands which form a barrier off the coast of Asia, and extend far to the south. On their eastern limit south of the equator these islands, New Ireland, the Salomon Islands, the New Hebrides, New Caledonia, the Fiji Islands, backed up by New Guinea and by the northern part of Australia, form a nearly continuous line reaching to the southern tropic, in a south-easterly direction, and cause almost the whole of the equatorial current to turn to the north."‡ At the same time, on each side of the equator, the north-east and south-east trade winds blow toward this current, and waifs and strays from the land must be continually tending towards its stream. The nature of the drift has been well described by Mr. Bennett. In lat. 2° 53′ S., long. 174° 55′ E., a remarkable white line was observed on the surface of the ocean, about two miles a head of the ship, and bearing the appearance of a low surf, breaking on a sand bank or reef. It proved to be an undulated line of froth, or scum, several yards in width, extending on either side as far as was visible with the naked eye, and accompanied

---

* Nat. Hist. of the Azores, p. 102.
† Crotch. Ib.
‡ Phy. Geog. in Relation to prevailing Winds and Currents, p. 228.

Digitized by Google

with a heterogeneous assemblage of floating mollusks, small fish, crabs and other marine animals, *drift wood* and oceanic birds, these last either dead or in a torpid and helpless state on the surface of the sea. As Mr. Bennett well remarks, this line of miscellanies on the ocean denoted the termination of a current, which in its progress had swept the surrounding waters of their passive or feeble denizens, and had borne them thus far in a dense and confused mass.*

The agency of man in the distribution of this butterfly is another cause which, like "winds and currents," must be estimated as an efficient but only probable, or perhaps possible, cause.

In a short article by Mr. Scudder† on the introduction of this butterfly into the Pacific Islands, he gives, from the information of a correspondent, the fact of the young larvæ being found for the first time in Ponape, of the Caroline Range, feeding on some young milk weeds which had just been accidentally introduced amongst some other plants contained in a wardian case from Honolulu.

Pickering, in enumerating the introduced plants of Polynesia, states that within the past century, and for the most part within the memory of persons now living, a variety of animals and plants have been introduced into the islands of the Pacific in European and American vessels. He was informed at the Hawaiin Islands that the centipede‡ was "introduced five years previously from Mazatlan." It had greatly multiplied at Honolulu, where the "house scorpion" likewise abounded, and was likewise believed to have been imported from Mazatlan.§ Mr. Bennett also relates that "after we had been at sea for several weeks, and even months, it was not uncommon to find on board the 'Tuscan' many birds and land insects in a living state, from the hardy beetle to the delicate and more ephemeral butterfly, whose germs had probably been received on board together with supplies of fruit and vegetables."‖ There seems one objection to the theory of the dispersal of *D. Archippus* being incidental on chance dispersion of its ova on the leaves of its food plant. The eggs take but a few weeks to hatch, and the young larvæ

* Whaly, Voy. Round the World, vol. ii. pp. 62—64.
† "Psyche," vol. i. p. 81.
‡ See Petites Nouvelles Entomologiques, No. 166.
§ Races of Man, p. 339.
‖ Whaly, Voy. Round the World, vol. i. p. 252.

Digitized by Google

would probably soon be seen, or their depredations on the food plant must be soon discovered; but although this is not a fatal objection, the undeniable introduction of the genus *Asclepias* by the agency of man is one of the most important necessities for the continuance of the existence of this butterfly, however or by what means its own dispersal has occurred.

Having glanced at the means of dispersal, we will now briefly examine the conditions that must be favourable to the survival of this butterfly in a new habitat.

1stly. *The presence of its food plant.*—It is scarcely necessary to remark that however a butterfly may be dispersed by winds, waves or the agency of man, without its food plant also exists, it has little chance of surviving in a new habitat, excepting in the rarer instance of adaptability to a new food in another genus or family of plants. Now the favourite food of *D. Archippus* is the various species of the genus *Asclepias*, to one of which, however, "*A. phytolaccoides*," according to Mr. Riley, it shows a "wonderful dislike" As regards the range of this genus we cannot do better than quote from the "Genera Plantarum." "Species ad 60, pleræque Americæ borealis Mexico inclusa incolæ, paucæ in America centrali V australi obviæ, 2 Africanæ, 1 per regiones calidiores utriusque orbis late dispersa, in plerisque tamen locis inquilina." This wide ranging species is the *A. curassavica*, Linn., and which in the South Sea Isles has been recorded from Eromanga, New Hebrides and the Tongan and Society Isles, "probably introduced as not known to the older botanists." *

Professor Westwood reminds me that no *Asclepias* is found wild in Europe. The original habitat of the genus *Asclepias* agrees with that of *D. Archippus*, for, as De Candolle observes in treating of *A. curassavica* as found in the Society Isles, "mais il me paraît évident qu'il s'est échappé des jardins, ou qu'il a été apporté dans ces localités. On sait combien cette plante se multiplie aisément;" and as the majority of the species of *Asclepias* are American, he further remarks, "ce qui me paraît indiquer assez clairement l'origine."† *A. fructicosa* is recorded from the Azores, but is a South African species, and Mr. Watson considers it is there only as a

* B. Seeman, Flora Vitiensis, p. 161.
† Géographie Botanique, tome ii. p. 788.

Digitized by Google

casual escape from gardens.* This introduced plant at the Azores, now apparently establishing its habitat, will be one of the most favourable conditions to *D. Archippus* surviving in the same locality; and it would be deeply interesting to know whether that butterfly has again appeared or established itself at the Azores since the visit of Mr. Godman.

2ndly. *Its immunity or protection from the attacks of birds, &c.*—In its larval condition it has been found by Mr. Riley to be refused by turkeys, chickens, toads or snakes; and this has been ascribed to the odour, which, scarcely appreciable when the larvæ are in the open air, is pungent and nauseous in the extreme when a few of them are shut up a short time in a tight box.† May not this probably be from the nature of its food plant? Most of the species of the genus *Asclepias* possess powerful medicinal properties, especially the roots of *A. curassavica*. Its gay colour is likewise considered a protection; but if we look at the fleshy processes or horns of the larva as also protective, we shall find that it compares unfavourably in that respect with the larvæ of *D. Plexippus* and *Chrysippus* as figured by Horsefield and Moore, and *D. Berenice* as figured by Boisduval and Lecomte, all of which species have three pairs of these fleshy processes, whilst *D. Archippus* has but two. The larva only obtains its bright colours slowly, or rather they become developed as it increases in growth; hence upon the hypothesis of colour protection we should have expected the larva to have had the same immunity in its younger stages, or else the theory must break down. But for this there remains another contingency, as, from Mr. Riley's description of the young larva, it is covered with minute black bristles arising from still more minute warts; and as we know that most hairy caterpillars are likewise the rejected of birds, it seems in this case that the young larvæ, though obscurely coloured, are as much protected by their hairy coats as they are later on by a totally different and more showy exterior. It is also protected in the perfect condition probably by the same odour which affords its larvæ immunity from the attacks of birds, &c. It is unnecessary to descant upon the extreme importance of this protection, as the absence of insectivorous birds, or an immunity from

* Nat. Hist. of the Azores, p. 194.
† Third Ann. Rep. of Ins. of Miss. p. 149.

Digitized by Google

the attacks of the same, would be most necessary to a few lepidopteral colonists, struggling in a new land to establish their naturalization.

3rdly. *Insects which quickly develop from egg to imago can effect their transformations during the warmth of a short summer in a higher latitude than their original habitat.*—I have not hitherto met with notice of this important factor. Taking an example from the vegetable world, the annuals which adorn our gardens, though often indigenous to more tropical climes, are yet enabled to run their course from the seed stage to leafing and flowering and back to the seed stage again during our short summer, solely through the rapidity with which they perform their cycle of existence. Like causes must produce like results in the life of a butterfly, that can effect its transformation in regions so climatically diverse as Canada and Central America. The larva of *D. Archippus* has but three moults, and frequently acquires its full growth within three weeks from hatching, and remains in the pupa condition only about ten days;* whilst, according to Mr. Edwards, there are, at least presumably, three broods yearly in W. Virginia—one early in June, the second about the beginning of August, and in September or October is a third brood, which hybernate.†

To recapitulate.—Starting with the assumption of North America as the original home of this butterfly, we have seen that winds and currents are in all cases in strict accordance with its distribution, whether from one side of the continent to Europe and the Azores or from the other to the South Sea Islands and Australia; that its high flight and gregarious habits would favour its dissemination by gales of wind; that prevalent winds would continue to waft it in the direction of its new abode; and that beneath it would flow oceanic currents, bearing their natural flotsam and jetsam, frequently trunks of trees, in the same direction. Analogy would lead us to suppose that the occurrence of these butterflies being blown out to sea would be a frequent one; but the number that could successfully cross a wide ocean would be very few and only at very wide intervals of time. Now we learn from Mr. Riley that these butterflies hybernate through the winter and often appear in immense swarms in the autumn.

---

* Riley. Ib.
† Canadian Entomologist.

Digitized by Google

Supposing one of these swarms to be blown out to sea by a strong gale, again carried on by the prevalent winds, many ever succumbing, a few still being borne along, this remnant gradually becoming less, often totally extinct, but at some favoured time a floating trunk becoming a shelter for hybernation, the ocean currents bearing many of these trunks along their streams, few, very few being cast at all on an opposite continent or island, and still fewer that should possess a hybernating butterfly, and we shall at once see how seldom colonization by these means would be, and yet how efficacious a movement of dispersion it becomes. We have also seen how its food plant has by the agency of man been carried to most of the countries where it has found a new home, and that its ova may have been carried by the same agency. But though its dispersal by these means is necessarily of a very slow and rare description, its survival in a new abode has been seen to have everything in its favour. The wide range of its food plant is combined with an immunity from attacks of enemies, whilst its rapid mode of effecting its transformations renders it capable of completing its cycle of existence during a short summer and hybernating through a cold winter in temperate climes, or through a time of drought in the torrid zone. Nature seems thus to reveal one of her processes, which appearing to depend on something allied to chance, yet in her own good time effects those complexities of fauna which not the Entomologist alone finds in examining typical faunas one of the most involved problems and unexplained phenomena.

Since reading the above, I have been referred to a paper by Dr. Semper, "Die Wanderung von Danais Erippus, nach den Südsee-Inseln, Australien und Celebes," published in the "Journal des Museum Godeffroy," Heft IV., which I have as yet been unable to see.

Digitized by Google

IX. *On the* Lepidoptera *of the Amazons, collected by* James W. H. Trail, Esq., *during the years* 1873 *to* 1875. By Arthur Gardiner Butler, F.L.S., F.Z.S., &c.

[Read 4th April, 1877.]

Part I.—RHOPALOCERA.

The large collection of *Lepidoptera* made by Mr. Trail was obtained over a very wide area, and consequently is of great interest. The expedition to which Mr. Trail was attached was sent out by the Amazon Steam Navigation Company, and his duty was to furnish botanical reports on the country, with the object, apparently, of learning the nature and capabilities of the country. It was in no way a government expedition, and, although Mr. Trail was permitted to make botanical and zoological collections, it was no part of his official duty.

The following summary of the ground gone over by the expedition has been kindly forwarded to me by Mr. Trail, in order that some idea may be given of where the insects were collected:—

"The expedition ascended the Amazons to Tabatinga, and also ascended several of the side rivers to the rapids, distances of from 100 to 800 miles. The side rivers ascended were, in order of time, the Trombetas, the Tapajos, the Jamunda, the Mauhes, the Abacaxis, the Madeira, the Rio Negro, the Purus, the Juruá, the Javary, and the Jutahi. About half the *Rhopalocera* and the greater part of the *Heterocera* were taken during five months spent on the four rivers last mentioned, and on the Solimões or Upper Amazon."

"Owing to the very short stay usually made at any one place by the expedition of which I was a member, as well as to my time being usually taken up with botanical work during such stoppages, I was seldom able to secure more than a very few specimens from each locality."

After reading the above, it is a fact highly creditable to

Digitized by Google

Mr. Trail, that he secured no less than 274 species of butterflies alone, in the intervals between his official duties. Of the species collected many are very rare, and several are beautiful new forms; but the greatest merit of the collection consists in the extreme care with which the precise locality, date of capture, and (where practicable) the habit of each specimen, is registered. With the assistance of such valuable information as Mr. Trail has thus given us, any collector may know positively where and at what time he is likely to obtain examples of the species here recorded; whilst the cabinet naturalist may form some opinion respecting their economy, as, for instance, whether or not they produce one, two, or even more broods in a year.

The Heterocerous *Lepidoptera*, which are more numerous and far more difficult to determine than the butterflies, must be reserved for a future communication.

My thanks are due to Messrs. Druce and Hewitson for kindly permitting me to consult their cabinets in order to the more satisfactory determination of some of the obscurer groups.

Family NYMPHALIDÆ.

Danainæ, *Bates.*

Danais, *Latreille.*

1. Danais eresimus.

Papilio eresimus, Cramer, Pap. Exot. ii. pl. 175, G, H (1779).

Low swamp at Prainha, 16th and 17th November, and 8th December, 1873; Rio Sapo, 21st November, and Tunantins, 24th November, 1874. Captured in the marsh upon a white composite flower, *Marokyopoton.*

Heliconoid Danainæ.

Methona, *Doubleday.*

2. Methona confusa.

Methona confusa, Butler, Cist. Ent. i. p. 151, n. 1 (1873).

Alter do Chao, 7th January; forest behind Arimanahy, 9th, beach at Samauma, Río Tapajos, 13th, Obydos, 26th March; Conceicão, Rio Mauhes, 7th May; Tunantins, 23rd November, 1874; and Serpa, 13th February, Almeyrim, 19th February, 1875.

Digitized by Google

DIRCENNA, *Doubleday.*

3. Dircenna rhoëo.

Dircenna rhoëo, Felder, Wien. Ent. Monatschr. iv. p. 102, n. 58 (1860).

In the bush at Serpa, 25th April, and Rio Madeira, 4th June, 1874.

4. Dircenna obfuscata.

Dircenna obfuscata, Butler, Cist. Ent. i. p. 151, n. 2 (1873).

Prainha, 26th November, 1873; Rio Purus, 11th September, 1874.

ITHOMIA, *Hübner.*

5. Ithomia cornelia.

Heliconia cornelie, Guérin, Icon. Règne Anim. Ins. texte, p. 472 (1844).

Teffé, 18th December, 1874.

PTERONYMIA, *Butler & Druce.*

6. Pteronymia sao.

Hymenitis sao, Hübner, Zutr. Exot. Schmett. figs. 767, 768 (1832).

Woods at Prainha, 14th November, in low swamp, 16th, 17th, and 8th December, 1873; also at Obydos, 24th January, 1874.

LEUCOTHYRIS, *Butler & Druce.*

7. Leucothyris epicharme.

Ithomia epicharme, Felder, Wien. Ent. Monatschr. vi. p. 77, n. 60 (1862).

Pupunha, Rio Juruá, 5th November, and Tabatinga, 30th, 1874.

8. Leucothyris virginia.

Ithomia virginia, Hewitson, Exot. Butt. i. *Ith.* pl. 3, fig. 18 (1852).

Forest at Fritoria of Joãs Gabriel, Rio Purus, 16th September, at Gepatiny 30th; Porto Salvo, 4th October, and at Uruçaca, Rio Juruá, 1st November, 1874.

9. Leucothyris perspicua, n. sp.

Allied to *L. onega* and *L. epicharme*; primaries quite as in the latter species; black, with a cuneiform basi-

Digitized by Google

discoidal patch, an oblique spot beyond it; a subapical internally-excavated band, and a pyriform spot on first median interspace, hyaline white; secondaries hyaline white, with the costal and external margins rather broadly black-bordered, as in *L. flora;* primaries below with a dull red submarginal streak; one or two whitish dots near the apex; secondaries with the costal margin and a submarginal streak continuous with it dull red; about seven white dots near the margin: expanse of wings 2 inches 1 line.

Parana quara, E. bank of Rio Madeira, near Sapucaia oroca, 5th June; Uruçaca, Rio Juruá, 1st November, 1874.

10. Leucothyris terra.

Ithomia terra, Hewitson, Exot. Butt. i. *Ith.* pl. 3, fig. 16 (1852).

Pupunha, Rio Juruá, 1st November, 1874.

11. Leucothyris oriana.

Ithomia oriana, Hewitson, Exot. Butt. ii. *Ith.* pl. 22, fig. 134 (1859).

Forest at Rio Javary, 6th December, 1874.

NAPEOGENES, *Bates.*

12. Napeogenes adelphe, var.

Napeogenes adelphe, Bates, Trans. Linn. Soc. xxiii. p. 534, n. 3 (1862).

Forest behind Arimanahy, 10th January, Uricurituba, Rio Tapajos, 17th March, 1874; Pará, 6th March, 1875.

SAIS, *Hübner.*

13. Sais rosalia.

Papilio rosalia, Cramer, Pap. Exot. iii. pl. 246, B (1782).

Prainha (in marsh), 8th December, 1873; Obydos, 24th January, 5th and 16th February; Lake Tapagem, Rio Trombetas, 28th; Forest at Fritoria of Joãs Gabriel, Rio Purus, 16th September, 1874.

SCADA, *Kirby.*

14. Scada theaphia.

Oleria theaphia, Bates, Trans. Linn. Soc. xxiii. p. 529, n. 1 (1862).

Forest at Guaranasal, Rio Tapajos, 10th March, 1874.

Digitized by Google

CALLITHOMIA, *Bates.*

15. Callithomia alexirrhoë.

Callithomia alexirrhoë, Bates, Trans. Linn. Soc. xxiii. p. 522 (1862).

Uricurituba, Rio Tapajos, 17th March, 1874.

CERATINIA, *Hübner.*

16. Ceratinia castanea, n. sp. (Pl. III. fig. 7.)

Allied to *C. anastasia*, but with the angulated dentated area between the central and discal series of black spots in primaries bright sulphur-yellow instead of mahogany-red, and the submarginal yellow spots larger and seven in number: expanse of wings 2 inches 9 lines.

♂. Forest near Fritoria of Joãs Gabriel, 16th September, 1874.

♀. Pupunha, Rio Juruá, 1st November, 1874.

The male has the ground colour of the apical area black, and the conical marginal black spots of the secondaries are absent. This species is an excellent copy of *Melinæa pardalis*. It is quite distinct from Hopffer's *C. pardalina;* the latter seems to be nearer to *C. fluonia*.

MECHANITIS, *Fabricius.*

17. Mechanitis obscura.

Mechanitis obscura, Butler, Cist. Ent. ii. p. 149.

Pupunha, Rio Juruá, 5th November, 1874.

18. Mechanitis egaensis.

Mechanitis egaensis, Bates, Trans. Linn. Soc. xxiii. p. 531, pl. 56, fig. 7a (1862).

Ilha das Araras, Rio Madeira, 4th June, 1874; Pupunha, Rio Juruá, 5th November, 1874.

19. Mechanitis truncata.

Mechanitis truncata, Butler, Cist. Ent. ii. p. 150.

Ilha das Araras, Rio Madeira, 4th June, 1874.

20. Mechanitis pannifera. (Pl. III. fig. 8.)

Mechanitis pannifera, Butler, Cist. Ent. ii. p. 150.

Obydos, in the forest, 13th February, 1874.

21. Mechanitis plagigera.

Mechanitis plagigera, Butler, Cist. Ent. ii. p. 150.

Marsh at Prainha, 17th November, 1873.

Digitized by Google

22. Mechanitis visenda.

Mechanitis visenda, Butler, Cist. Ent. ii. p. 150.

Near Trovador, Rio Tapajos, about lat. 4° 15′ S., 13th March, 1874.

MELINÆA, *Hübner*.

23. Melinæa equicola.

Papilio equicola, Cramer, Pap. Exot. iv. pl. 297, F (1782).

Obydos, in the forest, 17th February, 1874.

24. Melinæa pardalis.

Melinæa pardalis, Bates, Trans. Linn. Soc. xxiii. p. 552, n. 7 (1862).

Rio Madeira, 29th May; Ilha das Araras, Rio Madeira, 4th June; Paranaquara, E. bank of Rio Madeira, near Sapucaia oroca, 5th June; forest at Gepatiny, Rio Purus, 30th September, 1874.

25. Melinæa mælus.

Mechanitis mælus, Hewitson, Exot. Butt. i. *Mech.* pl. 2, fig. 6 (1860).

Marsh at Prainha, 8th December, 1873; Obydos, in the forest, 16th and 17th February; Rio Curnem, Rio Trombetas, 5th March, 1874.

26. Melinæa egena.

Papilio egena, Cramer, Pap. Exot. ii. pl. 191, fig. D (1779).

Marsh at Prainha, 17th November and 8th December, 1873; Obydos, 24th January; Ilha das Araras, Rio Madeira, 4th June, 1874.

TITHOREA, *Doubleday*.

27. Tithorea harmonia.

Papilio harmonia, Cramer, Pap. Exot. ii. pl. 190, fig. D (1779).

Obydos, 24th January, 1874.

28. Tithorea cuparina.

Tithorea cuparina, Bates, Trans. Linn. Soc. xxiii. p. 552 (1862).

Igarapa, Bom Jardin, Rio Tapajos, 15th March, 1874.

Digitized by Google

SATYRINÆ, *Bates.*

TAYGETIS, *Hübner.*

29. Taygetis thamyra.
Papilio thamyra, Cramer, Pap. Exot. iii. pl. 242, B (1782).
Ilha das Araras, Rio Madeira, 4th June, 1874.

30. Taygetis andromeda.
Papilio andromeda, Cramer, Pap. Exot. i. pl. 96, A (1779).
Santarem, in a house, 18th January, 1874; Serpa, in the bush, 21st April; Lago cerrado, Rio Juruá, 30th October, 1874; 13th February, 1875; Pará, 10th March, 1875.
Var. *cinerescens.*
Prainha, in the marsh, 17th December, 1873.

31. Taygetis virgilia (var. *Rebecca*, Fabr.).
Papilio virgilia, Cramer, Pap. Exot. i. pl. 96, C (1779).
Serpa, in the bush, 21st April, 1874, and 13th February, 1875.

32. Taygetis valentina.
Papilio valentina, Cramer, Pap. Exot. iii. pl. 242, A (1782).
Ilha das Araras, Rio Madeira, 4th June, 1874.

EUPTYCHIA, *Hübner.*

33. Euptychia calpurnia.
Neonympha calpurnia, Felder, Reise der Nov. Lep. ii. p. 484, n. 836 (1867).
Rapid of Porteira, Rio Trombetas, 2nd March, 1874.

34. Euptychia metaleuca.
Neonympha metaleuca, Boisduval, Lép. Guat. p. 63 (1870).
Serpa, in the bush, 24th April; Ilha das Araras, Rio Madeira, 4th June; Juruapuca, Rio Juruá, in the forest, 28th October; Rio Juruá, near the mouth, 14th November, 1874; Serpa, 13th February, 1875.

Digitized by Google

35. Euptychia ocypete.

Papilio ocypete, Fabricius, Gen. Ins. p. 260 (1777).

Pedroso, Rio Purus, 25th September, 1874; Almeirim, 19th February, 1875.

36. Euptychia erigone.

Euptychia erigone, Butler, Proc. Zool. Soc. p. 466, n. 20; pl. 39, fig. 5 (1866).

Pupunha, Rio Juruá, 6th November, 1874.

37. Euptychia hermes.

Papilio hermes, Fabricius, Syst. Ent. p. 487, n. 195 (1775).

Prainha, in the marsh, 17th December, 1873; Bom Jardin, Tapajos, 14th March; Matatebem, opposite Itaituba, 26th March; Villa bella, 15th April; Serpa, in the bush, 21st April; Labria, Rio Purus, 1st October; Coary, Rio Solimões, 16th October; Rio Juruá, in the forest, 7th and 8th November; Fonteboa, 17th November, Teffé, 18th December, 1874.

38. Euptychia undulata.

Euptychia undulata, Butler, Proc. Zool. Soc. p. 475, n, 52; pl. 39. fig. 13 (1866).

Ygapo, at foot of Parentin Hills, 2nd April; Pupunha, Rio Juruá, 1st and 5th November, 1874.

39. Euptychia mollina.

Euptychia mollina, Hübner, Zutr. Ex. Schmett. figs. 105, 106 (1818).

Forest behind Arimanahy, 9th March; Obydos, in the forest, 26th March; Fáro, in the forest, Rio Jamunda, 9th April; Barcellos, in the forest, 30th June; Teffé, in the forest, 19th October, 1874.

40. Euptychia doris.

♀. *Papilio doris*, Cramer, Pap. Exot. i. pl. 8, figs. B, C (1775).

♂. *Papilio cephus*, Fabricius, Syst. Ent. p. 528, n. 359 (1775).

Barreiras das Araras, Rio Solimões, 15th November, 1874.

Digitized by Google

41. Euptychia herse.

Papilio herse, Cramer, Pap. Exot. i. pl. 10, figs. C, D (1775).

Rapid of Porteira, Rio Trombetas, 2nd March, 1874.

42. Euptychia tricolor.

Euptychia tricolor, Hewitson, Ann. & Mag. Nat. Hist. S. ii. vol. vi. p. 440 (1850); Westwood and Hewitson, Gen. Diurn. Lep. pl. 65, fig. 5 (1851).

♀. Rio Javary, in the forest, 4th December, 1874.

HETÆRA, *Fabricius.*

43. Hetæra piera.

Papilio piera, Linnæus, Mus. Lud. Ulr. p. 220 (1764); Cramer, Pap. Exot. iv. pl. 291, C—E (1782).

Gepatiny, Rio Purus, 30th September, 1874; Rio Javary, 4th December, 1874; Rio Jutahi, 1st February, 1875.

Taken in the forests.

PIERELLA, *Westwood.*

44. Pierella lena.

Papilio lena, Linnæus, Syst. Nat. i. 2, p. 784, n. 206 (1767); Cramer, Pap. Exot. iii. pl. 198, D, E (1782).

Lake Arapecu, Rio Trombetas, 3rd March; forest at Tarumá, Rio Negro, 31st July; Coary, Rio Solimões, 16th October, 1874.

ANTIRRHÆA, *Hübner.*

45. Antirrhæa miltiades.

Papilio miltiades, Fabricius, Ent. Syst. iii. p. 66, n. 205 (1793).

Boa Vista, Rio Madeira, 1st June, 1874.

Taken in the forest.

BRASSOLINÆ, *Bates.*

CALIGO, *Hübner.*

46. Caligo oberon.

Caligo oberon, Butler, Trans. Ent. Soc. London, p. 488 (1870).

In a house at Fonteboa, 15th December, 1874.

Digitized by Google

OPSIPHANES, *Westwood.*

47. Opsiphanes quiteria.
Papilio quiteria, Cramer, Pap. Exot. iv. p. 313, A—D (1782).
Barreiras de Jutahi, 6th February, 1875.

BRASSOLIS, *Fabricius.*

48. Brassolis sophoræ.
Papilio sophoræ, Linnæus, Mus. Lud. Ulr. p. 266 (1764); Clerck's Icones, pl. 35 (1764).
In a house at Santa Cruz; Rio Tapajos, 17th March, 1874; Pará, 4th March, 1875.

MORPHINÆ, *Butler.*

MORPHO, *Fabricius.*

49. Morpho achilles.
Papilio achilles, Linnæus, Mus. Lud. Ulr. p. 211 (1764); Clerck, Icones, pl. 24, fig. 2 (1764).
Santarem, 4th February, 1873; Pará, 2nd March, 1874; São Antonio da boa Vista, Rio Javary, 4th and 5th December, 1874.
Taken in the forest.

BIA, *Hübner.*

50. Bia actorion.
Papilio actorion, Clerck, Icones, pl. 36, fig. 2 (1764).
Lake Tapagem, Rio Trombetas, in the shady forest, 28th February; Rapid of Porteira, Rio Trombetas, 2nd March; forest behind Manaos, 26th August; Pupunha, Rio Juruá, 1st November, 1874; Rio Jutahi, above Rio Curnem, 30th January, 1875.

NYMPHALINÆ, *Bates.*

PROTOGONIUS, *Hübner.*

51. Protogonius castaneus.
Protogonius castaneus, Butler, Proc. Zool. Soc. p. 775, n. 10; pl. 69, fig. 2 (1873).
Ilha das Araras, Rio Madeira, 4th June, 1874.

Digitized by Google

AGANISTHOS, *Boisduval.*

52. Aganisthos orion.

Papilio orion, Fabricius, Syst. Ent. p. 485, n. 183 (1775).

Rio Jutahi, 1st February, 1875.

I do not follow Mr. Scudder in his views respecting this species (Bull. Buff. Soc. ii. p. 248). In the case of two names applied to the same insect by one author, the first described, even where the only indication is an earlier pagination, should be considered typical. In the present instance I adopt "*P. orion*" as indicative of the Amazon type, which differs from that of the Antilles.

53. Aganisthos cadmus.

Papilio cadmus, Cramer, Pap. Exot. i. pl. 22, figs. A, B (1775).

Boa Vista, Rio Madeira, 1st June, 1874.

MEGISTANIS, *Westwood.*

54. Megistanis deucalion.

Megistanis deucalion, Felder, Wien. Ent. Monatschr. iv. p. 238 (1860).

Rio Madeira (flew on board), 18th May, 1874; Igarape, at head of Lago de Antonio, Rio Madeira, 31st May; (on board the "Guajara") Rio Purus, 1st September; mouth of Parana pixuna, Rio Purus, 8th October; Rio Sapó, 21st November, 1874.

ADELPHA, *Hübner.*

55. Adelpha thoasa.

Heterochroa thoasa, Hewitson, Ann. & Mag. Nat. Hist. S. ii. vol. vi. p. 436; pl. 9, fig. 6 (1850).

Serpa, in the bush, 21st April, 1874; 13th February, 1875.

56. Adelpha juruana, n. sp.

Allied to *A. thesprotia*, but rather paler; the orange band of primaries terminating on the first median interspace; its termination distinctly bisinuate, the inner sinus receiving the apex of the white band, which continues thence to the inner margin; white band of secondaries considerably wider, its outer edge slightly convex; anal orange spot better defined; under surface altogether paler: expanse of wings 2 inches 5 lines.

Digitized by Google

Lago cerrado, Rio Juruá, 30th October, 1874.

We have also an example in the Museum Collection from E. Peru.

CATAGRAMMA, *Boisduval.*

57. Catagramma cynosura.

Catagramma cynosura, Doubleday, Gen. Diurn. Lep. pl. 28, fig. 2 (1847).

Rio Purus, west bank near Hyntanaham, 28th September, 1874.

Seen also below Gepatiny, 20th September, and at Labria, 2nd October, 1874.

58. Catagramma sorana.

Nymphalis sorana, Godart, Enc. Méth. ix. p. 422, n. 229 (1823).

Humayta Campo, Rio Madeira, 30th May, 1874.

CALLICORE, *Hübner.*

59. Callicore janeira.

Callicore janeira, Felder, Verh. Zool.-Botan. Ges. xii. p. 476, n. 50 (1862).

Mauhes River, 1st May, 1874.

EUBAGIS, *Boisduval.*

60. Eubagis racidula.

Eubagis racidula, Hewitson, Exot. Butt. i. *Eub.* pl. 1, figs. 2, 3 (1852).

Serpa, in the bush, 22nd April, 1874; Barreiras das Araras, Rio Solimões, 16th January, 1875.

61. Eubagis mæon.

Eubagis mæon, Doubleday, Gen. Diurn. Lepid. pl. 30, fig. 1 (1849).

Barreiras das Araras, Rio Solimões, 15th November, 1874.

62. Eubagis niveata, n. sp. (Pl. III. fig. 3.)

♂. Allied to *E. athemon*, but with the blue costal shot much brighter; no sub-basal dark brown band (Doubleday calls this band discoidal); outer border of secondaries considerably narrower; its inner edge evanescent: expanse of wings 1 inch 7 lines.

Ilha das Araras, Rio Madeira, 4th March, 1874.

We have the sexes from Pará in the British Museum

Digitized by Google

collection; the female has the sub-basal brown band, but it is much narrower than in *E. athemon*.

Eubagis myrson of Doubleday, which is said to be allied to *E. athemon*, is entirely distinct, being closely allied to *E. decima*. Indeed, I found Doubleday's type labelled as the female of Hewitson's species.

63. Eubagis limbata, n. sp. (Pl. III. fig. 2.)

Allied to *E. theseus*, but the basal two-thirds of the cell metallic blue-green, immediately followed by a rounded white spot; outer border blacker and rather narrower, of the secondaries with a well-marked submarginal white streak towards the apex; wings below with the orange coloration confined to the base, costa and borders, not running between the white spots; the metallic blue spots and lines much more vivid; outer border of secondaries rather narrower: expanse of wings 1 inch 6 lines.

Lago de Antonio, Rio Madeira, 31st May, 1874.

64. Eubagis leucothea.

Eubagis leucothea, Bates, Journ. Entom. ii. p. 320, n. 95 (1865).

Barreiras das Araras, Rio Solimões, 16th January, 1875.

65. Eubagis agacles.

Papilio agacles, Dalman, Anal. Ent. p. 47 (1823).

Serpa, in the bush, 22nd April; Conceicão, Rio Madeira, 1st June, 1874.

66. Eubagis ærata, n. sp.

♂. Nearly allied to *E. artemisia*, but the size of the largest examples of *E. militta* ♂, with the outer border as in the latter species: wings above brassy-green, with pale spots indistinctly visible through the wing; costa bronze-brown; a subcostal black spot at the end of the cell; apex, apical half of outer border, and a prominent lobate projection along the outer half of the third median branch, the margin, and a streak from the inner edge of the outer border to the first median branch, black; secondaries with the costal area bronzy-brown; a submarginal and a marginal black line, fringe white-varied: wings below much as in *E. artemisia*, but the basal area of primaries much more deeply orange, this colour also extending into the brown area of the wing between the white spots; blue spots more vivid; the blue streak which intersects the

Digitized by Google

transverse band of secondaries broken up: expanse of wings 2 inches.

Rio Madeira, 20th May, 1874.

This species flew on board. We have an example in the collection from the Rio Napo.

67. Eubagis artemisia.

Papilio artemisia, Fabricius, Ent. Syst. iii. 1, p. 101, n. 313 (1793).

Teffé, 18th December, 1874.

68. Eubagis mylitta.

Papilio mylitta, Cramer, Pap. Exot. iii. pl. 253, D, E (1782).

Serpa, in the bush, 21st and 24th April, 1874.

NICA, *Hübner*.

69. Nica sylvestris.

Nica sylvestris, Bates, Journ. Entom. ii. p. 204, n. 49 (1864).

Rio Jutahi, 1st February, 1875.

PERIA, *Kirby*.

70. Peria lamis.

Papilio lamis, Cramer, Pap. Exot. iii. pl. 238, E (1782).

Tabatinga, 30th October, 1874.

MEGALURA, *Blanchard*.

71. Megalura crethon.

Papilio crethon, Fabricius, Gen. Ins. p. 252, nn. 40, 41 (1776).

Mouth of Rio Urupuana, Rio Madeira, 4th June, 1874; Uttary, Rio Purus, 29th September; Pariti, Rio Purus, on the edge of the river, 5th October, 1874.

72. Megalura chiron.

Papilio chiron, Fabricius, Syst. Ent. p. 452, n. 40 (1775).

Obydos, 26th March; Pariti, Rio Purus, on the edge of the river, 5th October, 1874; Lago cerrado, Rio Juruá, 30th October.

Digitized by Google

73. Megalura norica.

Timetes norica, Hewitson, Exot. Butt. i. *Tim.* i. figs. 3, 4 (1852).

Cabari, Rio Negro, 1st July; Pupunha, Rio Juruá, 5th November, 1874.

MARPESIA, *Hübner.*

74. Marpesia peleus.

Papilio peleus, Sulzer, Gesch. Ins. pl. 13, fig. 4 (1776).

Barreiras da Parana pixuna, Rio Purus, 8th October, 1874.

Variety.—Lago cerrado, Rio Juruá, 30th October, 1874.

VICTORINA, *Blanchard.*

75. Victorina sulpitia.

Papilio sulpitia, Cramer, Pap. Exot. iv. pl. 328, A, B (1782).

Jauarapy, 12th January, 1874.

ANARTIA, *Hübner.*

76. Anartia jatrophæ.

Papilio jatrophæ, Linnæus, Mus. Lud. Ulr. p. 289 (1764); Cramer, Pap. Exot. iii. pl. 202, E, F (1782).

Mont Alégre, river bank, 28th October, 1873; San Antonio, Rio Trombetas, 26th February; Sta. Cruz, Rio Tapajos, 17th March; Serpa, in the bush, 22nd April; Lago cerrado, Rio Juruá, 30th October, 1874.

77. Anartia amalthea.

Papilio amalthea, Linnæus, Mus. Lud. Ulr. p. 288 (1764); Clerck, Icones, pl. 40, fig. 3 (1764)

Marsh at Prainha, 8th December, 1873; Serpa, in the bush, 22nd April; Pupunha, Rio Juruá, 5th November, 1874.

JUNONIA, *Hübner.*

78. Junonia genoveva.

Papilio genoveva, Cramer, Pap. Exot. iv. pl. 290, E, F (1782).

Serpa, in the bush, 22nd April, 1874; Abacaxis, 13th May, 1874.

Digitized by Google

TEMENIS, *Hübner.*

79. Temenis laothoe.

Papilio laothoe, Cramer, Pap. Exot. ii. pl. 132, A, B (1779).

Humayta, Rio Madeira, 30th May, 1874; Tunantins, 23rd November, 1874.

Taken in the forest.

EPICALIA, *Westwood.*

80. Epicalia acontius.

Papilio acontius, Linnæus, Mant. Plant. p. 537 (1771).

♂. Teffé, 19th October; ♀. Obydos, 26th January, 1874.

This species is better known by its later name of *E. antiochus*.

81. Epicalia micalia.

♀. *Papilio micalia*, Cramer, Pap. Exot. ii. pl. 108, C, D (1779).

Tunantins, 24th November, 1874.

82. Epicalia antinoë.

Nymphalis antinoë, Godart, Enc. Méth. ix. p. 410 (1823).

Amazons.

No note of the exact locality or date of capture accompanied this species.

AGERONIA, *Hübner.*

83. Ageronia ferentina.

Nymphalis ferentina, Godart, Enc. Méth. ix. p. 428 (1823).

Serpa, in the bush, 21st April, 1874.

Mr. Trail notes the clicking sound made by this and the other species of *Ageronia* when flying.

84. Ageronia amphinome.

Papilio amphinome, Linnæus, Syst. Nat. i. 2, p. 779, n. 176 (1766); Cramer, Pap. Exot. i. pl. 54, E, F (1779).

Tunantins, 23rd November, 1874.

"Caught on human excrement."—J. W. H. Trail.

Digitized by Google

85. Ageronia feronia.
Papilio feronia, Linnæus, Mus. Lud. Ulr. p. 283 (1764); Clerck, Icones, pl. 31, fig. 1 (1764).
Obydos, 23rd and 25th January, 1874.

86. Ageronia arinome.
Peridromia arinome, Lucas, Rev. Zool. p. 312 (1853).
Forest near the Rio Tapajos, 13th November, 1874.

PERIDROMIA, *Boisduval.*

87. Peridromia velutina.
Ageronia velutina, Bates, Journ. Entom. ii. p. 315, n. 82 (1865).
On board the "Guajara," below Tunantins, 23rd November, 1874.
Mr. Trail took what I suppose to be the female of this species in the Rio Trombetas on the 30th January; he notes it as a "river species."

DIDONIS, *Hübner.*

88. Didonis biblis.
Papilio biblis, Fabricius, Syst. Ent. p. 505, n. 261 (1775).
Parentins, 1st April; Uttary, Rio Purus, 30th September; Teffé, 18th December, 1874.

PYRRHOGYRA, *Hübner.*

89. Pyrrhogyra neærea.
Papilio neærea, Linnæus, Mus. Lud. Ulr. p. 297 (1764); Cramer, Pap. Exot. i. pl. 75, C, D (1779).
Pupunha, Rio Juruá, 5th November, 1874.

VILA, *Kirby.*

90. Vila emilia.
Papilio emilia, Cramer, Pap. Exot. iii. pl. 223, E, F (1782).
Obydos, in the forest, 12th February, 1874.

Digitized by Google

PHYCIODES, *Hübner*.

91. Phyciodes liriope.
Papilio liriope, Cramer, Pap. Exot. i. pl. 1, C, D (1775).
Low swamp at Prainha, 16th November, 8th and 17th December, 1873; Obydos, 23rd January, 1874; Trombetas, 30th January; Serpa, in the bush, 21st April; Pariti, Rio Purus, 5th October, 1874.

EUNICA, *Hübner*.

92. Eunica malvina.
Eunica malvina, Bates, Journ. Entom. ii. p. 195, n. 21; pl. 9, figs. 2, 2a (1864).
Lake Arapecú, Rio Trombetas, 3rd March, 1874.

93. Eunica bechina.
Cybdelis bechina, Hewitson, Exot. Butt. i. *Cybd.* pl. 2, fig. 10 (1852).
Paricatuba, Rio Purus, 8th September, 1874.

94. Eunica mygdonia.
Nymphalis mygdonia, Godart, Enc. Méth. ix. p. 416, n. 208 (1823).
Lago cerrado, 30th October, 1874.

DIONE, *Hübner*.

95. Dione juno.
Papilio juno, Cramer, Pap. Exot. iii. pl. 215, B, C (1782).
Serpa, in the bush, 22nd April, 1874.

96. Dione vanillæ.
Papilio vanillæ, Linnæus, Mus. Lud. Ulr. p. 306 (1764); Clerck, Icones, pl. 40, fig. 2 (1764).
Trombetas, 30th January; Matatebem, opposite Itaituba, 16th March; Mauhes river, 1st May, 1874.

97. Dione lucina.
Agraulis lucina, Felder, Wien. Ent. Monatschr. vi. p. 110 (1862).
Rio Sapó, 21st November, 1874.

Digitized by Google

COLÆNIS, *Hübner.*

98. Colænis julia.

Papilio julia, Fabricius, Syst. Ent. p. 509, n. 281 (1775).

Beside the fort at Santarem, 5th January; Rio Jutahi, 1st February; Serpa, in the bush, 21st April, 1874.

99. Colænis phærusa.

Papilio phærusa, Linnæus, Mus. Lud. Ulr. p. 293 (1764).

Obydos, 23rd January; Trombetas, 30th January; Serpa, in the bush, 21st and 23rd April; Rio Juruá, 8th November, 1874.

ERESIA, *Boisduval.*

100. Eresia clara.

Eresia clara, Bates, Journ. Entom. ii. p. 192, n. 14 (1864).

Obydos, 20th January; Uricurituba, Rio Tapajos, 17th March; Gepatiny, Rio Purus, in the forest, 30th September; Pupunha, Rio Juruá, 5th November; Barreiras das Araras, Rio Solimões, 15th November; Tunantins, 23rd November, 1874; Barreiras das Araras, 18th January, 1875; Serpa, 13th February, 1875.

HELICONINÆ, *Bates.*

EUEIDES, *Hübner.*

101. Eueides unifasciatus.

Eueides unifasciatus, Butler, Cist. Ent. p. 169, n. 46 (1873).

Tabatinga, 30th November, 1874.

102. Eueides thales, var.

Papilio thales, Cramer, Pap. Exot. i. pl. 38, C, D (1776).

Teffé, 18th December, 1874.

HELICONIUS, *Fabricius.*

103. Heliconius pardalinus (var. ?).

Heliconius pardalinus, Bates, Trans. Linn. Soc. xxiii. p. 555 (1862).

Forest at Reteneão, Rio Purus, 3rd October, 1874.

This form may be distinct, but the differences are confined to the banding of the secondaries.

Digitized by Google

104. Heliconius diffusus.

Heliconius diffusus, Butler, Cist. Ent. i. p. 168, n. 34 (1873).

Lago cerrado, Rio Juruá, 30th October, 1874.

105. Heliconius antiochus.

Papilio antiochus, Linnæus, Syst. Nat. i. 2, Add. p. 1068, n. 12 (1766); Cramer, Pap. Exot. i. pl. 38, E, F (1776).

Rapid of Porteira, Rio Trombetas, 1st January; on board the "Yeamiaba," 12th August; E. bank of Rio Purus, in the forest, 21st September; Sapó, 21st November, 1874.

106. Heliconius zobeide.

Heliconius zobeide, Butler, Ann. & Mag. Nat. Hist. S. iv. vol. 3, p. 18, n. 3; pl. 9, fig. 3 (1869).

Prainha, 1st December, 1873.

Taken in the woods.

107. Heliconius Wallacei.

Heliconius Wallacei, Reakirt, Proc. Acad. Nat. Sci. Phil. p. 242, n. 11 (1866).

Shady woods near Prainha, 6th December, 1873; Obydos, 18th February, 1874.

108. Heliconius rhea.

Papilio rhea, Cramer, Pap. Exot. i. pl. 54, C, D (1779).

Obydos, 24th January; Uruçaca, Rio Juruá, 1st November, 1874.

109. Heliconius clytia.

Papilio clytia, Cramer, Pap. Exot. i. pl. 66, C, D (1779).

Sta. Cruz, Rio Tapajos, 17th March, 1874.

110. Heliconius doris, var.

Nereis delila, Hiibner, Samml. Exot. Schmett. (1806—16).

Forest near Samauma, Rio Tapajos, 13th January; in the bush, Serpa, 22nd April, 1874.

Digitized by Google

111. Heliconius hermathena.

Heliconia hermathena, Hewitson, Exot. Butt. i. *Helic.* pl. 2, fig. 5 (1853).

Arimanahy, 10th Januury; Itápuáma, Rio Tapajos, 11th March, 1874.

Taken in the forest.

112. Heliconius melpomene.

Papilio melpomene, Linnæus, Mus. Lud. Ulr. p. 232 (1764); Cramer, Pap. Exot. ii. pl. 191, C (1779).

Obydos, 5th, 18th, 24th and 25th February, 1874.

113. Heliconius callicopis.

Papilio callycopis (sic), Cramer, Pap. Exot. ii. pl. 190, E (1779).

Serpa, in the bush, 22nd April, 1874.

114. Heliconius coralii.

Heliconius coralii, Butler, Cist. Ent. ii. p. 151.

Serpa, 21st and 25th April, 1874; 13th February, 1875.

115. Heliconius erythrea (var.).

Papilio erythrea, Cramer, Pap. Exot. ii. pl. 189, A (1779).

Obydos, 24th January, 1874.

The single example taken differs from the figure in the absence of red rays between the nervures of secondaries.

116. Heliconius mutabilis.

Heliconius mutabilis, Butler, Cist. Ent. ii. p. 151.

Serpa, 22nd and 24th April, 1874.

Lepidopterists can do as they please as to considering the four preceding forms to be varieties of one species; whether they are so or not, it is convenient to have names to know them by.

117. Heliconius lucia.

Papilio lucia, Cramer, Pap. Exot. iv. pl. 350, E, F (1872).

Serpa, in the bush, 21st April, 1874.

A beautiful variation from the type, in which the yellow spots bound the inner edge of the curved red band throughout its entire length.

Digitized by Google

118. Heliconius cybele.

Papilio cybele, Cramer, Pap. Exot. ii. pl. 188, A (1779).

Itápuáma, Rio Tapajos, in the forest, 11th March; Serpa, in the bush, 21st, 23rd and 24th April, 1874; 13th February, 1875.

119. Heliconius vesta.

Papilio vesta, Cramer, Pap. Exot. ii. pl. 119, A. (1779).

Forest behind Arimanahy, 9th January; Uricurituba, Rio Tapajos, 17th February; Fazenda near the rapids, 14th March; Matatebem, opposite Itaituba, 16th March, 1874.

Var. Ilha das Araras, Rio Madeira, 4th June, 1874.

120. Heliconius lativitta.

Heliconius lativitta, Butler, Cist. Ent. ii. p. 150.

Boa Vista, Rio Madeira, 1st June; Uruçaca, Rio Juruá, 1st November, 1874.

121. Heliconius aglaope.

Heliconius aglaope, Felder, Wien. Ent. Monatschr. vi. p. 79, n. 67 (1862).

Ilha das Araras, Rio Madeira, 4th June; in the forest at Gepatiny, Rio Purus, 30th September; Tabocal, 10th October; Lago cerrado, Rio Juruá, 30th October, 1874.

122. Heliconius lindigii.

Heliconius lindigii, Felder, Reise der Nov. Lep. ii. pl. 47, fig. 1 (1867).

Obydos, 27th March, 1874.

Family ERYCINIDÆ.

Nemeobiinæ, *Bates*.

Eurybia, *Hübner*.

123. Eurybia franciscana.

Eurybia franciscana, Felder, Wien. Ent. Monatschr. vi. p. 70, n. 24 (1862).

Conceicão, Rio Madeira, 1st June, 1874; Teffé, 19th October.

Taken in the forest.

Digitized by Google

124. Eurybia dardus.

Papilio dardus, Fabricius, Mant. Ins. ii. p. 30, n. 324 (1787).

Forest at head of Iripixy, Trombetas, 31st January; Ilha das Araras, Rio Madeira, 4th June; Parana quara, E. bank of Rio Madeira, near Sapucaia oroca, 5th June; Pupunha, Rio Juruá, 5th November; forest at San Antonio, Rio Javary, 7th December, 1874.

125. Eurybia juturna.

Eurybia juturna, Felder, Reise der Nov. Lep. ii. p. 288, n. 372 (1867).

Ilha das Araras, Rio Madeira, 4th June, 1874.

MESOSEMIA, *Hübner*.

126. Mesosemia philemon, var.

Papilio philemon, Cramer, Pap. Exot. i. pl. 22, G, H (1775).

Fonteboa, 16th December, 1874.

In the Museum Collection from Ega.

127. Mesosemia lætifica.

Mesosemia lætifica, Bates, Journ. Linn. Soc. Zool. ix. p. 373 (1868).

Sta. Cruz, Rio Tapajos, 17th March, 1874.

128. Mesosemia mosera.

Mesosemia mosera, Hewitson, Exot. Butt. ii. *Mes.* pl. 8, figs. 77—79 (1860).

Pupunha, Rio Juruá, 5th November, 1874.

129. Mesosemia sylvicolens, n. sp.

Nearly allied to *M. meana*, but browner, the white band of primaries rather more oblique; no white line (but a lilacine greyish one) beyond the white band of secondaries; the single intersecting black line running exactly through the centre of the white band: expanse of wings 1 inch 6 lines.

Forest at head of Iripixy, Rio Trombetas, 31st January, 1874.

130. Mesosemia thymetus.

Papilio thymetus, Cramer, Pap. Exot. ii. pl. 184, G (1779).

Humayta Campo, Rio Madeira, 20th May, 1874; Boa Vista, Rio Jutahi, 1st February, 1875.

Digitized by Google

131. Mesosemia Maria, n. sp.

Nearly allied to *M. crœsus;* much larger; the ocellus of primaries smaller, the black streak immediately beyond and below it tapering more towards its upper extremity so as to widen the succeeding blue band; secondaries with all the lines well defined on the lower surface: expanse of wings 1 inch 8 lines.

♂. Lake Arapecu, Rio Trombetas, 3rd March, 1874.

Quite like a large form of *M. crœsus* on the upper side.

CREMNA, *Westwood.*

132. Cremna phryxe.

Cremna phryxe, Felder, Reise der Nov. Lep. ii. p. 299, n. 398, pl. 37, figs. 23, 24 (1865).

Coary, Rio Solimões, 16th January, 1874.

EURYGONINÆ, *Bates.*

EURYGONA, *Boisduval.*

133. Eurygona mys.

Eurygona mys, Herrich-Schäffer, Auss. Schmett. figs. 37, 38 (1853).

Itaituba, 13th March, 1874.

134. Eurygona melaphæa.

Erythia melaphæa, Hübner, Zutr. Exot. Schmett. figs. 209, 210 (1823).

Fonteboa, Rio Solimões, 17th November, 1874.

135. Eurygona phœdica.

Eurygona phœdica, Boisduval, Sp. Gen. Lép. i. pl. 21, fig. 3 (1836).

Fonteboa, Rio Jutahi, 17th November, 1874.

ERYCININÆ, *Bates.*

ERYCINA, *Fabricius.*

136. Erycina aulestes.

Papilio aulestes, Cramer, Pap. Exot. ii. pl. 128, G (1779).

Barcellos, in the forest, 30th June; Tunantins, 24th November; Fonteboa, 15th December, 1874.

Digitized by Google

Diorhina, *Morrisse.*

137. Diorhina periander.

Papilio periander, Cramer, Pap. Exot. ii. pl. 188, C, D (1779).

Labria, Rio Purus, 1st October; Tabocal, Rio Purus, 10th October, 1874.

Chamælimnas, *Felder.*

138. Chamælimnas iæris.

Chamælimnas iæris, Bates, Journ. Linn. Soc. Zool. ix. p. 378 (1868).

Barreiras das Araras, Rio Solimões, 16th January, 1875.

Riodina, *Westwood.*

139. Riodina lysippus.

Papilio lysippus, Linnæus, Mus. Lud. Ulr. p. 332 (1764); Clerck, Icones, pl. 22, fig. 2 (1764).

Forest near Sobral, Rio Purus, 17th September, 1874; Pedroso, Rio Purus, 25th September; Barreiras das Araras, Rio Solimões, 16th January, 1875.

Cartea, *Kirby.*

140. Cartea vitula.

Limnas vitula, Hewitson, Ex. Butt. i. *Lim.* pl. 1, fig. 5 (1852).

Teffé, in the forest, 19th October, 1874.

141. Cartea Trailii, n. sp.

Allied to the preceding, but differing constantly (in both sexes) in the much greater width and elliptical form of the oblique pale-yellow patch on the apical area of primaries, and in the orange tegulæ, the much greater extent of orange on all the wings, and the lighter tint of the same; from *C. tapajona* (to which it is more nearly allied), it may at once be distinguished by the first mentioned character, namely, the size and width of the yellow spot: expanse of wings 1 inch 11 lines.

Teffé, in the forest, 19th October; Fonteboa, 12th and 17th November, 1874.

A common species, taken by Bates at Ega and St. Paulo.

Digitized by Google

AMARYNTHIS, *Hübner*.

142. Amarynthis micalia.

Papilio micalia, Cramer, Pap. Exot. i. pl. 94, F (1779).

Barreiras das Araras, Rio Solimões, 16th January; Pupunha, Rio Juruá, 5th November, 1874.

HELICOPIS, *Fabricius*.

143. Helicopis cupido.

Papilio cupido, Linnæus, Mus. Lud. Ulr. p. 313 (1764); Cramer, Pap. Exot. ii. pl. 164, D, G (1779).

Prainha, 1st and 17th December, 1873; marsh near Obydos, 11th February; Obydos, 26th March; São Paulo, 26th November, 1874.

Among *Caladia*.

A variety occurs intermediate between *H. cupido* and *H. lindeni*; it coexists with the latter at Prainha, and therefore casts a doubt on the distinctness of that form.

144. Helicopis lindeni.

Helicopis lindeni, Grote, Bull. Buff. Soc. ii. p. 108, pl. 2 (1874).

Marsh near Prainha, 1st and 17th December, 1873.

EMESIS, *Fabricius*.

145. Emesis spreta.

Emesis spreta, Bates, Journ. Linn. Soc. Zool. ix. p. 385 (1868).

Coary, Rio Solimões, 16th October, 1874.

SYMMACHIA, *Hübner*.

146. Symmachia trochilus.

Caria trochilus, Erichson, Schomb. Reise, iii. p. 601 (1848).

Teffé, 18th December, 1874.

147. Symmachia argiope.

Erycina argiope, Godart, Enc. Méth. ix. p. 573, n. 44 (1823).

Jauarapy, 13th January, 1874.

148. Symmachia punctata, n. sp.

Wings above dull black; basal half covered with small, irregular, tawny spots; outer border bright tawny, enclos-

Digitized by Google

ing a submarginal series of black spots; fringe black; primaries with a slender, oblique, testaceous litura across the cell, a pentagonal group of dots beyond the cell, partly testaceous and partly white; body dull black, tegulæ tawny: wings below dull black, all the markings testaceous: expanse of wings 1 inch.

Pupunha, Rio Juruá, 5th November, 1874.

Allied to *S. hippea* of Herrich-Schäffer. I cannot imagine why the latter should be removed from *Symmachia;* it is certainly not congeneric with *Cricosoma leopardinum.*

Excepting in form, *S. punctata* is almost exactly like *S. calligrapha.*

Mesene, *Westwood.*

149. Mesene sophistes.

Mesene sophistes, Bates, Journ. Linn. Soc. Zool. ix. pl. 386 (1868).

Fonteboa, 16th December, 1874.

Recently figured by Moeschler under the name of *M. pactolus.*

150. Mesene trucidata, n. sp.

The single example in Mr. Trail's collection being both faded and imperfect, I take my description from a specimen obtained by Mr. Bates at Ega.

Black, primaries crossed by a broad oblique and slightly arched carmine band, secondaries crossed by a central, slightly arched band of half the width; wings below paler, basal area and outer border spotted with grey: expanse of wings 1 inch.

Coary, 16th October, 1874.

Nearly allied to *M. cingulus,* but with the carmine band of double the width (in Mr. Trail's specimen it has faded to orange).

Calydna, *Westwood.*

151. Calydna hiria.

Erycina hiria, Godart, Enc. Méth. ix. p. 584, n. 95 (1823).

Pupunha, 5th November, 1874.

Digitized by Google

METACHARIS, *Butler*.

152. Metacharis regalis.

Metacharis regalis, Butler, Ent. Month. Mag. iii. p. 175, n. 4 (1867).

Fazenda, near rapids, Rio Tapajos, 14th March, 1874; forest at St. Vicenzio, Rio Purus, 22nd September, 1874.

153. Metacharis lucius.

Hesperia lucius, Fabricius, Ent. Syst. iii. 1, p. 319, n. 209 (1793).

Rapid of Porteira, Rio Trombetas, 2nd March; Barreiras das Araras, Rio Solimões, 15th November, 1874.

LASAIA, *Bates*.

154. Lasaia meris.

Papilio meris, Cramer, Pap. Exot. iv. pl. 366, B, C (1782).

Boa Vista, Rio Jutahi, 2nd February, 1874.

THAROPS, *Hübner*.

155. Tharops felsina.

♀. *Lemonias felsina*, Hewitson, Exot. Butt. iii. *Lem.* pl. 3, figs. 27, 28 (1863).

♂. Manaos, in the bush, 24th August, 1874.

The male is far more pleasing than the female; the primaries are black, transversely streaked with dark green and grey; the secondaries have the base, costa and apex black; the central area, outer border and veins slaty grey, and the area which remains white; there are several indistinct, blackish, submarginal dots.

LEMONIAS, *Westwood*.

156. Lemonias pseudocrispus.

Lemonias pseudocrispus, Westwood, Gen. Diurn. Lepid. p. 459, n. 27 (1851); Butler, Journ. Linn. Soc. Zool. ix. pl. 6, figs. 9, 10 (1867).

Prainha, in the woods, 6th December, 1873; Mauhes river, 2nd May and 30th April, 1874.

157. Lemonias cerealis.

Lemonias cerealis, Hewitson, Exot. Butt. iii. *Lem.* pl. 4, fig. 37 (1863).

Barreiras de Jutahi, 18th January, 1875.

Digitized by Google

ECHENAIS, *Hübner.*

158. Echenais violacea.

Lemonias violacea, Butler, Journ. Linn. Soc. Zool. ix. p. 214, pl. 6, figs. 2, 3 (1867).

♀. Pupunha, Rio Juruá, 5th November, 1874.

159. Echenais mollis, n. sp. (Pl. III. fig. 4.)

♂. Allied to the preceding; primaries soft lilac-blue, the costa, base, outer border, and a transverse subapical band (tapering from costa to second median, interrupted by the nervures, divided from the outer border by a lunulate lilac line), black-brown; three spots in the cell, and three below it, black; a submarginal lilac line intersecting the black-brown border; a whitish diffused discal streak from the inner margin; secondaries snow white; costa pale brown, subcostal area lilacine; some black spots near the base; the apical margin, and three apical submarginal dots, black; wings below much as in the allied species: expanse of wings 1 inch 5 lines.

Fonteboa, 17th November, 1874.

160. Echenais sordida, n. sp.

Quite like *E. Hübneri*, excepting that all the markings which are lilac in that species are greyish-brown in this: expanse of wings 1 inch to 1 inch, 3 lines.

Itaituba, 10th March; Tabocal, Rio Purus, 10th October, 1874.

ANATOLE, *Hübner.*

161. Anatole zygia.

Lemonias maculata zygia, Hübner, Samml. Exot. Schmett. (1806—16).

Obydos, 23rd and 26th January; 13th and 17th February; Rapid of Porteira, Rio Trombetas, 2nd March; Parica, Rio Mauhes, 5th May, 1874.

Taken in the forest.

162. Anatole pulcherrima.

Anatole pulcherrima, Butler, Journ. Linn. Soc. Zool. ix. p. 226, n. 7; pl. 6, fig. 27 (1867).

Forest at Tabocal, Rio Purus, 8th October, 1876.

Digitized by Google

163. Anatole epulus.
Papilio epulus, Cramer, Pap. Exot. i. pl. 50, C, D (1779).
Prainha, 17th November, 1873; near Port Jaquarary, Rio Tapajos (on the beach), 12th January; Sta. Cruz, Rio Tapajos, 17th March, 1874.

Group THISBE, *Hübner*.

164. Anatole irenæa.
Papilio irenæa, Cramer, Pap. Exot. iv. pl. 328, C, D (1782).
Tabatinga, 30th November, 1874.

NYMPHIDIUM, *Fabricius*.

165. Nymphidium arctos, var.
Nymphidium arctos, Hewitson, Exot. Butt. i. *Nymph.* pl. 1, figs. 1, 2 (1852).
Obydos, 24th January, 1874.

166. Nymphidium tytia.
Papilio tytia, Cramer, Pap. Exot. ii. pl. 121, C, D (1779).
Fonteboa, Rio Solimões, 17th November, 1874.

167. Nymphidium arche.
Nymphidium arche, Hewitson, Exot. Butt. iii. *Nymph.* pl. 2, fig. 10 (1865).
Pupunhazinho, Rio Juruá, 9th November, 1874.

168. Nymphidium molpe.
Limnas subtilis molpe, Hübner, Samml. Exot. Schmett. (1806—16).
Serra de Parentins, 1st April; Pedroso, Rio Purus, 25th September, 1874.

169. Nymphidium bæotia, Hewitson, Exot. Butt. i. *Nymph.* pl. 1, fig. 5 (1852).
Shady woods near Prainha, 6th December, 1873; Obydos, 26th March; on board the "Yeamiaba," 13th August; Paricatuba, Rio Purus, 8th September; E. bank of Rio Purus, 21st September; Coary, Rio Solimões, 16th October; Juruapuca, Rio Juruá, 28th October;

Digitized by Google

Lago cerrado, Rio Juruá, 30th October; Uruçaca, 1st November; Rio Juruá, near the mouth, 14th November; Fonteboa, 17th November, 1874.

170. Nymphidium caricæ.

Papilio caricæ, Linnæus, Mus. Lud. Ulr. p. 324 (1764); Clerck, Icones, pl. 20, fig. 2 (1764).

Iripixy, Rio Trombetas, 30th January; Lake Arapecu, Rio Trombetas, 3rd March; Itapuama, Rio Tapajos, 11th March; Fazenda near the rapids, 14th March; Mananaá, N. bank of Rio Solimões, near Rio Purus, 6th September; forest on E. bank of Rio Purus, 21st September; Tabocal, Rio Purus, 10th October; Fonteboa, 17th November, 1874.

171. Nymphidium cachrus.

Papilio cachrus, Fabricius, Mant. Ins. ii. p. 78, n. 715 (1787).

Forest at head of Iripixy, Trombetas, 31st January, 1874.

172. Nymphidium stibopteris, n. sp.

Precisely like *N. onœum* of Hewitson (Ex. Butt. 4, *Nymph.* pl. iv. figs. 27, 28), excepting that the costal brown border of primaries is narrower and more regular and the orange spots in the cell are wanting: expanse of wings 1 inch 7 lines.

Fonteboa, 17th November, 1874.

173. Nymphidium cavifascia, n. sp.

Close to *N. pelops*, but the ochreous area of primaries deeply excavated by a quadrate blackish spot in the end of the discoidal cell; outer border with its external half red spotted with black; abdomen not brown above: expanse of wings 1 inch 4 lines.

Shady woods near Prainha, 6th December, 1873.

The deep excavation in the anterior margin of the ochreous area gives this species a very distinct appearance.

174. Nymphidium ochra.

Nymphidium ochra, Bates, Journ. Linn. Soc. Zool. ix. p. 399 (1868).

Rio Jutahi, 1st February, 1875.

Digitized by Google

175. Nymphidium ascolia.
Nymphidium ascolia, Hewitson, Exot. Butt. i. *Nymph.* pl. 1, fig. 4 (1852).
N. bank of Rio Solimões, near mouth of Rio Purus, 6th September, 1874.

THEOPE, *Westwood.*

176. Theope eudocia.
Theope eudocia, Doubleday, Gen. Diurn. Lepid. pl. 70, fig. 4 (1851).
Forest at Sobral, Rio Purus, 17th September, 1874.

ARICORIS, *Westwood.*

177. Aricoris velutina.
Aricoris velutina, Butler, Journ. Linn. Soc. Zool. ix. pl. 7, fig. 11 (1867).
Fonteboa, Rio Solimões, 17th November, 1874.

178. Aricoris myrtis, var.
Aricoris myrtis, Westwood, Gen. Diurn. Lepid. p. 450, n. 6 footnote (1867).
Teffé, Rio Solimões, in the forest, 19th October, 1874.

STALACHTIS, *Hübner.*

179. Stalachtis phlegetontia.
Acræa phlegetontia, Perty, Del. Anim. Art. p. 153, pl. 30, figs. 2, 2 b (1830—34).
Obydos, 24th and 25th January, and 14th February; Aveyros, 11th March; Serpa, 22nd and 24th April; Mauhes river, 30th April and 1st May, 1874.

180. Stalachtis euterpe.
Papilio euterpe, Linnæus, Mus. Lud. Ulr. p. 226 (1764); Cramer, Pap. Exot. iii. pl. 246, D (1782).
Shady woods near Prainha, 6th December, 1873; Rapid of Porteira, Rio Trombetas, 2nd March, 1874; Lake Juruty, 4th May; west bank of Rio Mauhes, nearly opposite Mucajatuba, 5th May; forest at Boa Vista, Rio Madeira, 1st June; Rio Purus, 12th October; Coary, Rio Solimões, 16th October; Pupunhazinho, Rio Juruá, 9th and 14th November, 1874.

Digitized by Google

181. Stalachtis calliope.

Papilio calliope, Linnæus, Mus. Lud. Ulr. p. 223 (1764); Clerck, Icones, pl. 41, fig. 4 (1764).

Shady woods near Prainha, 6th December, 1873; forest at head of Iripixy, Rio Trombetas, 31st January; Obydos, 18th February; forest on E. bank of Rio Madeira, about 4° 3′, 3rd June; N. bank of Rio Solimões, near mouth of Rio Purus, 6th September; Pedroso, Rio Purus, 20th September; Pariti, Rio Purus, 5th October; Tabocal, Rio Purus, 10th October; Rio Juruá, near the mouth, 14th November, 1874.

182. Stalachtis lineata.

Nereis lineata, Guérin, Icon. Règne Anim. Ins. texte, p. 473 (1844).

Obydos, 18th February; forest at Maracaná, Rio Jamunda, 7th April; forest at Cararaucu, 18th April, 1874.

183. Stalachtis Trailii, n. sp. (Pl. III. fig. 1.)

Allied to the preceding: wings hyaline white, with the veins and borders black; primaries with a streak in the cell, a broad oblique band across the end of the cell from costa to outer margin, and a much more slender band from the end of the cell to inner margin, black; apex broadly black; a small rounded orange spot on the outer border near the end of the postmedian oblique black band; a yellow dot at base of secondaries; body brown, thorax white-spotted, tegulæ orange-spotted; collar and pectus orange at the sides; legs and venter streaked with creamy white, anal segments below orange: wings below nearly as above, but the primaries with a slender oblique subapical orange streak: expanse of wings 2 inches 2 lines.

Conceicão, Rio Mauhes, 7th May, 1874.

This is a well-marked and beautiful species.

184. Stalachtis evelina.

♀. *Stalachtis evelina*, Butler, Ann. and Mag. Nat. Hist. S. iv. vol. v. p. 365 (1870); Lep. Exot. pl. xiv. fig. 6 (1870).

♂. Rapid of Porteira, Rio Trombetas, 2nd March, 1874.

Digitized by Google

Family LYCÆNIDÆ.

LYCÆNINÆ, *Butler*.

LAMPIDES, *Hübner*.

185. Lampides cassius.

Papilio cassius, Cramer, Pap. Exot. i. pl. 23, figs. C, D (1775).

Lycæna marina, Reakirt, Proc. Acad. Nat. Sci. Phil. p. 87 (1868).

Lake Arapecu, Rio Trombetas, 3rd March; Sta. Cruz, Rio Tapajos, 17th March; Serpa, in the bush, 24th April; Ilha das Araras, Rio Madeira, 4th June; Paricatuba, Rio Purus, 8th September, 1874.

THECLINÆ, *Butler*.

BITHYS, *Hübner*.

186. Bithys strephon.

Papilio strephon, Fabricius, Syst. Ent. p. 522, n. 334 (1775).

Teffé, 19th October, 1874.

187. Bithys punctum?

Thecla punctum, Herrich-Schäffer, Auss. Schmett. figs. 57, 58 (1852—58); Hewitson, Ill. Diurn. Lep. pl. 40, figs. 132, 133 (1867).

Maturá, 25th November, 1874.

This species was taken at light! Mr. Hewitson was doubtful whether or not it was a variety of Herrich-Schäffer's species, as the border of primaries above is narrower, and on the underside there is no white spot near the costa of secondaries; but in these characters it approaches the figures in the "Illustrations of Diurnal Lepidoptera," though it differs from the latter in having no white spots on the under surface of primaries; I am therefore content, for the present, to consider it a variety of *B. punctum*. In these little things, of whose variability we know nothing *certainly*, it is safer not to establish species upon single examples.

188. Bithys ingæ.

Papilio ingæ, Sepp, Surin. Vlind. i. pl. 17 (1848).

São Paulo, 26th November, 1874.

Captured among *Caladia*.

Digitized by Google

189. Bithys leucophæus?

Bithys leucophæus, Hübner, Zutr. Exot. Schmett. figs. 87, 88 (1818).

Obydos, in the forest, 17th February, 1874.

TMOLUS, *Hübner.*

190. Tmolus vibulena.

Thecla vibulena, Hewitson, Ill. Diurn. Lep. pl. 76, figs. 599, 600.

Porto salvo, Rio Purus, 4th October, 1874; Ipocuriha, 7th October.

191. Tmolus beon.

Papilio beon, Cramer, Pap. Exot. iv. pl. 319, B, C (1782).

Prainha, shady woods, 6th and 8th December, 1873; Rio Trombetas, 3rd March; Itaituba, 13th March; Teffé, 19th October, 1874.

192. Tmolus temesa.

Thecla temesa, Hewitson, Descr. Lyc. p. 1, n. 2 (1868).

Coary, Rio Solimões, 16th October, 1874.

193. Tmolus celmus.

Papilio celmus, Cramer, Pap. Exot. i. pl. 55, G, H (1779).

Tunantins, 23rd November, 1874.

194. Tmolus adria.

Thecla adria, Hewitson, Ill. Diurn. Lep. pl. (76?)

Serpa, in the bush, 22nd April, 1874.

When I obtained the name of *T. adria*, the plate on which it was figured was unpublished, and the part into which it would come, not being yet in the Museum,* I am uncertain whether or not it is yet published.

195. Tmolus isobeon.

Tmolus isobeon, Butler & Druce, Cist. Ent. 5, p. 108 (1872); Lep. Exot. p. 161; pl. lvii. fig. 2 (1873).

♀. Shady woods near Prainha, 6th December, 1873.

* November, 1876.

Digitized by Google

196. Tmolus atrox, n. sp.

Above smoky brown, with a purplish tinge; below greyish-brown; primaries with a discocellular litura, and an interrupted discal transverse line from subcostal nervure to first median branch, black-brown, edged externally with whitish; two submarginal grey lunules, on the median interspaces; fringe brown; secondaries with a discocellular litura as in primaries; a black discal line, straight and oblique from costa to third median, then dentate-sinuate (forming a W on the median interspaces), edged outwardly with white; margin black, edged inwardly with white; a red-bordered black spot between the tails, a trace of a second on second median interspace, another at anal angle, and a conical red spot in the subanal sinus of the discal line; a pale apical submarginal stripe from apex to third median branch: expanse of wings 1 inch 1 line.

Pedroso, Rio Purus, 25th September, 1876.

On the under surface this species nearly resembles *T. denarius*, but the coloration of the upper surface is altogether too dark. It is allied to that species and to *T. atnius* of Herrich-Schäffer; also to *T. lugubris*, Moeschler.

197. Tmolus clitumnus (Doubleday in litt.). (Pl. III. fig. 6.)

Above like *T. demonassa;* below more like *T. clarina* and *T. sangala.* Primaries above blue-black, inner margin incurved; secondaries brilliant *Morpho* blue; anal margin black; body black: wings below golden brown; primaries with a straight, pale-edged, dusky line crossing the wing beyond the cell; a paler line nearer to the outer margin; secondaries with an oblique discal line ending in a W-shaped marking, red-edged internally and white-edged externally, enclosing two conical red spots externally near anal angle; a greyish submarginal line from apex to second median; a semicircular red spot, dotted with black, and edged externally with white, between the tails; anal area grey, internally white and externally black-edged, enclosing two black and red spots at anal angle: expanse of wings 1 inch.

Shady woods near Prainha, 6th December, 1874.

198. Tmolus pereza, n. sp.

♂. Wings above like *T. uzza;* below differing in the secondaries having only one large subcostal black spot near the base; the other basal spots being entirely ab-

Digitized by Google

sent: expanse of wings 10 lines; ♀ brown above: expanse 11 lines.

Prainha, 8th December, 1873; Pupunha, Rio Juruá, 5th November, 1874.

I have not the slightest doubt of the entire distinctness of this species.

199. Tmolus vesulus.

Papilio vesulus, Cramer, Pap. Exot. iv. pl. 340, I, K (1782).

Lago cerrado, Rio Juruá, 30th October, 1874; Barreiras das Araras, Rio Solimões, 15th November, 1874.

200. Tmolus opalia.

Thecla opalia, Hewitson, Ill. Diurn. Lep. p. 134, n. 220; pl. 53, figs. 300, 301 (1869).

Coary, Rio Solimões, 16th October, 1874.

MITHRAS, *Hübner*.

201. Mithras hemon.

Papilio hemon, Cramer, Pap. Exot. i. pl. 20, D, E (1775).

♂. Prainha, in the woods, 8th December, 1873.

The single male is small and indistinctly marked.

CHALYBS, *Hübner*.

202. Chalybs mavors.

Theritas mavors, Hübner, Zutr. Exot. Schmett. figs. 189, 190 (1818).

Forest behind Arimanahy, 9th January, 1874; Coary, Rio Solimões, 16th October, 1874.

203. Chalybs nobilis.

Thecla nobilis, Herrich-Schäffer, Auss. Schmett. figs. 55, 56 (1853).

Tunantins, 24th November, 1874.

Thecla bimaculata of Moeschler comes very close to this species.

THERITAS, *Hübner*.

204. Theritas actæon.

Papilio actæon, Fabricius, Syst. Ent. App. p. 829 (1775).

Barreiras das Araras, Rio Solimões, 16th January, 1875.

"Always found flying amongst maize."—*Trail.*

Digitized by Google

205. Theritas tuneta.
Thecla tuneta, Hewitson, Ill. Diurn. Lepid. p. 71, n. 6; pl. 28, figs. 14, 15 (1865).
Barreiras das Araras, Rio Solimões, 16th January, 1875.
Taken in company with the preceding species.

BRANGAS, *Hübner*.

206. Brangas inachus.
Papilio inachus, Cramer, Pap. Exot. i. pl. 36, D (1775).
Obydos, 24th January, 1874.

207. Brangas sista.
Thecla sista, Hewitson, Ill. Diurn. Lepid. p. 92, n. 91; pl. 37, figs. 98, 99 (1867).
Coary, Rio Solimões, 16th October; Teffé, forest, 19th October; Fonteboa, 17th November, 1874.

ŒNOMAUS, *Hübner*.

208. Œnomaus marsyas.
Papilio marsyas, Linnæus, Mus. Lud. Ulr. p. 315 (1764); Clerck, Icones, pl. 41, fig. 1 (1764).
Ipocuriha, Rio Purus, 7th October, 1874.

PANTHIADES, *Hübner*.

209. Panthiades pelion.
Papilio pelion, Cramer, Pap. Exot. i. pl. 6, E, F (1775).
Ipocuriha, Rio Purus, 7th October, 1874.

210. Panthiades linus.
Papilio linus, Sulzer, Gesch. Ins. pl. 19, figs. 10, 11 (1776).
Obydos, 20th January, 1874.

Family PAPILIONIDÆ.

PIERINÆ, *Bates*.

MYLOTHRIS, *Hübner*.

211. Mylothris lorena.
Pieris lorena, Hewitson, Exot. Butt. i. *Pieris*, pl. 1, fig. 7 (1852).
Tabatinga, 30th November, 1874.

Digitized by Google

LEUCIDIA, *Doubleday.*

212. Leucidia brephos.
Mancipium vorax brephos, Hübner, Samml. Exot. Schmett. (1806-16).
Pedroso, Rio Purus, 25th September, 1874.

TERIAS, *Swainson.*

213. Terias clara.
Terias clara, Bates, Journ. Entom. i. p. 243, n. 12 (1861).

214. Terias diodina, var.
Terias diodina, Butler, Ann. and Mag. Nat. Hist. S. 4, vol. xv. p. 397 (1875).
Pariti, Rio Purus, on the edge of the river, 5th October, 1874.

215. Terias agave.
Papilio agave, Cramer, Pap. Exot. i. pl. 20, H, I (1775).
Beside the fort at Santarem, 4th January, 1873; Lago cerrado, Rio Juruá, 30th October, 1874; Pupunha, Rio Juruá, 5th November.

PHŒBIS, *Hübner.*

216. Phœbis hersilia.
Papilio hersilia, Cramer, Pap. Exot. ii. pl. 173, C, D (1779).
Fonteboa, Rio Solimões, 17th November, 1874.

217. Phœbis trite.
Papilio trite, Linnæus, Mus. Lud. Ulr. p. 248 (1764); Cramer, Pap. Exot. ii. pl. 141, C, D (1779).
Lago cerrado, Rio Juruá, 30th October, 1874.

CALLIDRYAS, *Boisduval.*

218. Callidryas philea.
Papilio philea, Linnæus, Syst. Nat. i. 2, p. 764, n. 104 (1766); Cramer, Pap. Exot. ii. pl. 173, E, F 1779).
Lago cerrado, Rio Juruá, 30th October; Rio Sapó, 21st November, 1874.

Digitized by Google

Aphrissa, *Butler*.

219. Aphrissa statira.

Papilio statira, Cramer, Pap. Exot. ii. pl. 120, C, D (1779).

Mouth of Rio Urupuama, Rio Madeira, 4th June, 1875; Serpa, 21st April, 1874; Mauhes river, 1st May; Abacaxas river, 12th May; Paricatuba, Rio Purus, 8th September; Lago cerrado, Rio Juruá, 30th October; Rio Sapó, 21st November. ♀ *Abnormal*. Pariti, Rio Purus, on the river's edge, 5th October, 1874.

Pieris, *Boisduval*.

220. Pieris demophile.

Papilio demophile, Clerck, Icones, pl. 28, fig. 4 (1764).

Lake Tapagem, Rio Trombetas, 28th February, 1874.

Daptonura, *Butler*.

221. Daptonura pedrosina, n. sp.

♀. Wings above creamy white; primaries with the costa narrowly black; a broad, black-brown, apical patch from apical third of costa to just below first median branch, trisinuate internally; a short oblique black-brown disco-cellular bar; secondaries imperfect (probably with a brown border); wings below nearly as above, the brown areas more cupreous in tint; base of secondaries and sides of pectus golden orange: expanse of wings 2 inches 7 lines.

Pedroso, Rio Purus, 25th September, 1874.

This species seems most nearly to approach *D. peruviana*.

Moschoneura, *Butler*.

222. Moschoneura pinthæus.

Papilio pinthæus, Linnæus, Mus. Lud. Ulr. p. 258 (1764).

Leptalis pinthæus, Butler, Fabr. Cat. pl. 2, fig. 1 (1870).

Rio Tapajos, 12th January, 1873; Head of Iripixy, Trombetas, 21st January, 1874; Matatebem, Rio Tapajos, opposite Itaituba, 16th February, 1874.

Taken in the forests.

Digitized by Google

PAPILIONINÆ, *Bates.*

PAPILIO, *Linnæus.*

223. Papilio gargasus.

Parides gargasus, Hübner, Verz. bek. Schmett. p. 87, n. 909 (1816).

Papilio æneus, Cramer (nec Linn.), Pap. Exot. iii. pl. 279, A, B (1872).

Uricurituba, Rio Tapajos, 17th March, 1874.

224. Papilio sonoria.

♀. *Papilio sonoria*, G. R. Gray, Cat. Lep. Ins. B. M. p. 57, pl. 10, fig. 1 (1852).

♂. Uricurituba, Rio Tapajos, 17th March, 1874.

225. Papilio opalinus, n. sp. (Pl. III. fig. 5.)

♀. Wings above smoky brown; primaries with the apical half, excepting the borders, very pale; veins black; secondaries darker, the outer border nearly black; a broad fascia from the second subcostal branch to the anal angle, widest in the middle, rose red with an opaline shot, crossed by black veins, slightly convex internally and subangulated and undulated externally; fringe white in the sinuations of the wings; body dark brown, head and thorax blackish, a carmine spot on each side of the collar, margins of pectus spotted with rose red, also the two basal segments of the venter; anus rose red; wings below nearly as above, but the fascia of secondaries rather paler in the centre and not opalescent: expanse of wings 3 inches 9 lines.

Pedroso, Uttary, Rio Purus, 25th September, 1874.

I cannot find that this species is anywhere described. It is an interesting species, inasmuch as it possesses the opalescence common to many males of this genus, although in a less marked degree.

226. Papilio polydamas.

Papilio polydamas, Linnæus, Mus. Lud. Ulr. p. 192 (1764); Drury, Ill. Ex. Ent. i. pl. 17, figs. 1, 2 (1773).

Obydos, 26th January; Sta. Cruz, Rio Tapajos, 17th March, 1874.

227. Papilio belus.

Papilio belus, Cramer, Pap. Exot. ii. pl. 112, A, B (1779).

Boa Vista, Rio Jutahi, 2nd February, 1865.

Digitized by Google

228. Papilio protesilaus.

Papilio protesilaus, Linnæus, Mus. Lud. Ulr. p. 209 (1764); Clerck, Icones, pl. 27, fig. 2 (1764).

Mauhes river, a few miles below the Cachocira de Portad, 1st May; Urariá or Tupinambaranas channel, 7th and 9th May; Rio Negro, near Manaos, 14th June, 1874.

229. Papilio dolicaon.

Papilio dolicaon, Cramer, Pap. Exot. i. pl. 17, C, D (1775).

Boa Vista, Rio Jutahi, 1st February, 1875.

230. Papilio caudius.

Princ. dom. caudius, Hübner, Samml. Exot. Schmett. (1806—16).

♂, ♀. Serpa, in the bush, 21st and 22nd April, 1874.

The male more nearly resembles typical *P. torquatus* than our Museum example does, which renders it probable that the female of *P. torquatus* is at least dimorphic. It is possible that it may be tetramorphic, but of this we have at present no positive evidence.

231. Papilio thoas.

Papilio thoas, Linnæus, Mant. Plant. p. 536 (1771); Drury, Ill. Exot. Ent. i. pl. 22, figs. 1, 2 (1773).

Serpa, in the bush, 25th April, 1874.

Family HESPERIIDÆ.

Goniurus, *Hübner*.

232. Goniurus simplicius.

Papilio simplicius, Stoll, Suppl. Cramer, pl. 39, figs. 6, 6 E (1790).

♂. Prainha, 8th December, 1873; Rio Trombetas, 30th January. ♀. Matatebem, opposite Itaituba, 16th March, 1874; Serpa, 21st and 24th April.

233. Goniurus esmeraldus, n. sp.

Nearly allied to *G. proteus;* above more brilliantly shot with green, the hyaline spots of primaries larger; secondaries below with the markings much darker, the spots on basal area bordered externally with creamy whitish; the discal band straighter, bordered externally, at its lower extremity, with whitish, and connected with

Digitized by Google

apex at its upper extremity; centre of body below white: expanse of wings 2 inches 1 line.

Villa bella 15th April, 1874.

I believe this to be a distinct species. We have a long series of *G. proteus*, but no example agreeing with *G. esmeraldus* in the characters above noted.

234. Goniurus zilpa?

Goniurus zilpa, Butler, Lep. Exot. p. 109, pl. 40, fig. 2 (1872).

Altar do chao, 7th January, 1874.

The single example is in very bad condition, but seems to agree with my species.

235. Goniurus undulatus.

Eudamus undulatus, Hewitson, Descr. Hesp. p. 4, n. 4 (1867).

Obydos.

The date of capture is not recorded, but was probably January, 1874.

EUDAMUS, *Swainson*.

236. Eudamus orion.

Papilio orion, Clerck, Icones, pl. 42, fig. 3 (1764).

Iripixy river, Trombetas, 30th January, 1874.

237. Eudamus brachius, var.

Goniurus brachius, Hübner, Zutr. Exot. Schmett. figs. 609, 610 (1832).

Serpa, 13th February, 1875.

One example, with the white border of secondaries rather narrow.

238. Eudamus aunus.

Papilio aunus, Fabricius, Sp. Ins. p. 134, n. 618 (1781).

Uricurituba, forest road, Rio Tapajos, 17th March, 1874; Serpa, in the bush, 21st April, 1874.

239. Eudamus chalco.

Goniurus chalco, Hübner, Zutr. Exot. Schmett. figs. 313, 314 (1823).

Serpa, in the bush, 21st April, 1874.

Digitized by Google

TELEGONUS, *Hübner*.

240. Telegonus anaphus.
Papilio anaphus, Cramer, Pap. Exot. ii. pl. 178, F (1779).
Serpa, in the bush, 24th April, 1874.

241. Telegonus talus.
Papilio talus, Cramer, Pap. Exot. ii. pl. 176, D (1779).
Uraria channel, 8th April, 1874.
Taken at light!

242. Telegonus labriaris, n. sp.
Bears a vague resemblance to *T. pherenice* of Hewitson.
Primaries above purplish-brown, with 10 hyaline spots, one in the cell the others in an oblique Z-shaped series beyond it; the spot in the cell, and those above the median branches, notched externally; the fourth, fifth and ninth of the discal series punctiform, the eighth largest; basal area sprinkled with ochreous hairs; secondaries bright ochreous, with the costal and outer borders, a band across the cell, and another across the disc, purplish-brown; a round hyaline spot near the base; fringe white-varied; body brown, clothed with yellow hairs, palpi white; primaries below deep purplish, greyish at base; internal area and borders of the hyaline spots pale tawny; secondaries deep purplish, irrorated with grey, and shot with green; two rows of ochraceous spots of different sizes across the disc; hyaline spot as above; body below bronzy-brown, tibiæ and tarsi of legs whity-brown: expanse of wings 1 inch 11 lines.
Labria, Rio Purus, 1st October, 1874.
A very distinct and well-defined species.

HYDRÆNOMIA *Butler*.

243. Hydrænomia orcinus.
Eudamus orcinus, Felder, Reise der Nov. Lep. iii. p. 510, n. 887; pl. 71, figs. 4, 5 (1867).
Coary, Rio Solimões, 16th October, 1874.

Digitized by Google

ÆTHILLA, *Hewitson.*

244. Æthilla amphion.

Proteides amphion, Hübner, Zutr. Exot. Schmett. figs. 631, 632 (1832).

Rio Jutahi, 1st February, 1875.

245. Æthilla infanda, n. sp.

Allied to *Æ. coracina*, but smaller: wings above black; primaries with a transverse ill-defined streak across the basal area, an oblique patch from the costa across the discocellulars to the third median branch, and two undulated submarginal streaks (connected at the nervures), greyish-sericeous; secondaries with the base, an ill-defined curved streak across the end of the cell, the apex and anal angle greyish; abdominal area purplish-brown; body black: wings below paler; primaries dark purplish-brown, with the outer border chocolate-brown; secondaries chocolate-brown, with the costal third, a macular transverse band beyond the cell, and indications of a similar submarginal band, purplish-brown; body below chocolate-brown: expanse of wings 2 inches.

Tunantins, 23rd November, 1874.

PHAREAS, *Westwood.*

246. Phareas gentius.

Papilio gentius, Cramer, Pap. Exot. ii. pl. 179, C (1779).

Lake Arapecu, Rio Trombetas, 2nd March, 1874.

It is to be hoped that this species will not receive another name; the male of *P. neleus* of Linnæus has recently received two, viz. *Entheus infernalis* and *Phareas hesychius*.

247. Phareas cœleste.

Phareas cœleste, Westwood and Hewitson, Gen. Diurn. Lepid. pl. 78, fig. 4 (1852).

No note of exact locality, or date of capture. The pupa is attached to a leaf like Stoll's figure 1*a* on plate 6.

ERYCIDES, *Hübner.*

248. Erycides palæmon.

Papilio palæmon, Cramer, Pap. Exot. ii. pl. 131, F (1779).

Humayta Campo, Rio Madeira, 20th May, 1874.

Digitized by Google

PYRRHOPYGA, *Hübner*.

249. Pyrrhopyga zonara.
Pyrrhopyga zonara, Hewitson, Exot. Butt. iv. pl. *Pyrrh.* 2, fig. 10 (1872).
Rio Jutahi, 1st February, 1875.

PROTEIDES, *Hübner*.

250. Proteides chalestra.
Hesperia chalestra, Hewitson, Exot. Butt. v. pl. *Hesp.* 5, figs. 44, 45 (1872).
Humayta Campo, Rio Madeira, 30th May, 1874.

CARYSTUS, *Hübner*.

251. Carystus antoninus.
Hesperia antoninus, Latreille, Enc. Méth. ix. p. 746, n. 47 (1823).
Obydos, 25th January, 1874; Pedroso, Rio Purus, 25th September.

PAMPHILA, *Fabricius*.

Section CALPODES.

252. Pamphila nyctelius.
Hesperia nyctelius, Latreille, Enc. Méth. ix. p. 746, n. 47 (1823).
Shady woods near Prainha, 6th December, 1873; Pariti, Rio Purus, 5th October, 1874.

Section GEGENES.

253. Pamphila herminieri ?
Hesperia L'Herminier, Latreille, Enc. Méth. ix. p. 777, n. 135 (1823).
Obydos, 24th January, 1874.

254. Pamphila philemon.
Papilio philemon, Fabricius, Syst. Ent. p. 534, n. 392 (1775).
Obydos, 25th January, Oca, Rio Trombetas, 25th February, Ilha das Araras, Rio Madeira, 4th June, 1874.

255. Pamphila sodalis, n. sp.
Allied to the preceding species, but the wings uniformly olive-brown, no trace of the pale internal area on

Digitized by Google

under surface of primaries; body darker brown; palpi whitish at the base laterally: expanse of wings 1 inch 3 lines.

Obydos, 18th February, 1874.

256. Pamphila alumna, n. sp.

♂. Wings and body above uniformly olive-brown; primaries below with the costal and apical areas paler, the latter bounded within (between the subcostal branches) by three obliquely-placed, brown-edged, light-brown dots; two similarly coloured larger dots on the median interspaces; margin dusky; fringe grey, with a pale basal line; secondaries paler than above, greyish at base, crossed immediately beyond the cell by a zigzag series of dark brown spots; a less distinct arched series of greyish-brown spots across the disc; margin and fringe as in primaries; palpi white, with black terminal joint and grey heirs; pectus grey, whitish behind; legs pale brown; venter white, brown at the sides, with a central longitudinal blackish line: expanse of wings 1 inch 2 lines.

♀. The spots on primaries large and well defined: expanse of wings 1 inch 4 lines.

Matatebem, 16th March, Abacaxis, 13th May, 1874; Pupunha, Rio Juruá, 5th November.

257. Pamphila allubita, n. sp.

♂. Wings above olive-brown, with bronzy reflections; primaries with two spots placed obliquely on median interspaces, and two dots on discoidal interspaces, stramineous; body rather deeper brown; palpi and margin of eyes sordid white; wings below much paler; median spots of primaries whitish, discoidal spots obsolete; pectus greyish, venter sordid white: expanse of wings 1 inch 1 line.

Obydos, 24th January, 1874; Rio Sapó, 21st November.

258. Pamphila ancillaris, n. sp.

♂. Wings above olive-brown, with bright bronzy and green reflections; primaries with the oblique male streak composed of two blade-like white lituræ placed end to end; body dark brown; wings below paler than above, the central area dusky; two small spots placed obliquely on the median interspaces, and three minute dots placed transversely between the subcostal branches, whity-brown, very indistinct; secondaries with a curved indistinct

Digitized by Google

whity-brown streak broken up into spots by the median branches; body below sordid white: expanse of wings 1 inch 4 lines.

Oca, Rio Trombetas, 28th February, 1874.

259. Pamphila chydæa, n. sp.

♀. Above dark brown; fringe of wings sordid white; primaries with two small hyaline spots placed obliquely on the median interspaces, and one hyaline point (scarcely visible) beyond the end of the cell; primaries below with the costal area irrorated with testaceous; a longitudinal interno-median white streak; secondaries irrorated all over with testaceous, five ill-defined spots of the same colour forming a waved line across the disc; body below sordid white, venter with a longitudinal central black line: expanse of wings 1 inch 3 lines.

Serpa, in the bush, 24th April, 1874.

260. Pamphila compta, n. sp.

♂, ♀. Above dark brown; primaries with two small, hyaline-white spots placed obliquely on the median interspaces, and two hyaline points (scarcely visible) beyond the end of the cell; wings below paler; primaries with the central area dusky; two hyaline spots in the median interspaces, and three small decreasing dots between the subcostal branches; secondaries with a zigzag, arched, discal series of seven testaceous spots; pectus greyish, palpi and centre of venter sordid white, the latter with a longitudinal black line: expanse of wings 1 inch 3 lines.

Oca, Rio Trombetas, 26th February; Matatebem, opposite Itaituba, 16th March; Villa bella, 15th April, 1874.

261. Pamphila confixa, n. sp.

Black-brown, fringe of wings grey; primaries with three small, lunular, hyaline-white spots placed obliquely below the median branches, and two unequal dots beyond the cell; sides of palpi and margins of eyes white: wings below purplish-brown; primaries with the central area black; a testaceous patch (diffused externally) on the interno-median interspace, and above it two hyaline-white spots; a hyaline-white dot beyond the cell; secondaries with an indistinct arched series of four pale-brown spots beyond the cell; pectus grey, legs pale brown; venter

Digitized by Google

white, testaceous at the sides, with a central longitudinal black line: expanse of wings 1 inch 7 lines.

Parentins, 1st April, 1874.

Allied to *P. homolea* and near to *P. lucifer*.

262. Pamphila evans, n. sp.

♂. Above uniform deep brown, fringe grey; wings below brilliantly shot with purple; veins brown; internal area of primaries greyish-brown; palpi white at base; pectus dark grey; legs whity-brown; venter white, with brown sides, and a well-marked central longitudinal brown stripe: expanse of wings 1 inch 2 lines.

Rapid of Porteira, Rio Trombetas, 2nd March, 1874.

This species may be placed near *P. æcas*.

263. Pamphila hilas.

Hesperia hilas, Wallengren, Wien. Ent. Monatschr. iv. p. 38, n. 21 (1860).

Itaituba, 13th February; Rio Tapajos, 15th March; Villa bella, 15th April, 1874.

Section Apaustus.

264. Pamphila menes.

Papilio menes, Cramer, Pap. Exot. iv. pl. 393, H, I (1782).

Itaituba, 13th February; Paricatuba, 12th October; Rio Juruá, 7th November, 1874.

265. Pamphila stictomenes, n. sp.

Allied to *P. menes*, but above like *P. hilas*. Above dark brown; primaries with three oblique median and three smaller vertical white spots; secondaries with an angulated discal series of six testaceous dashes; head and thorax olivaceous; wings below paler, tinted with purplish; apical area of primaries and the whole of secondaries white-veined; spots as above, but all white; body below whitish in the centre: expanse of wings 1 inch.

Obydos, in the forest, 12th February; Oca, Rio Trombetas, 26th February, 1874.

Digitized by Google

Section PAMPHILA (typical).

266. Pamphila phylæus.

Papilio phylæus, Drury, Ill. Exot. Ent. i. pl. 13, figs. 4, 5 (1773).

♀. Sta. Cruz, Rio Tapajos, 17th March, 1874.

PYRGUS, *Hübner*.

267. Pyrgus syrichtus.

Papilio syrichtus, Fabricius, Syst. Ent. p. 534, n. 394 (1775).

Prainha, 8th December, 1873; Obydos, 26th January and 4th February; Fazenda, near the rapids, Rio Tapajos, 14th March; Sta. Cruz, Rio Tapajos, 17th March; Serpa, 22nd April, 1874, and 13th February, 1875; Mauhes river, 2nd May, 1874.

268. Pyrgus arsalte.

Papilio arsalte, Linnæus, Mus. Lud. Ulr. p. 245 (1764); Clerck, Icones, pl. 23, fig. 2 (1764).

Iripixy, Rio Trombetas, 30th January; Serpa, in the bush, 22nd and 24th April, 1874; 13th February, 1875.

269. Pyrgus laginia.

Leucochitonea laginia, Hewitson, Descr. Hesp. p. 48, n. 7 (1868).

Gaviäo, 10th November, 1874.

ACHLYODES, *Hübner*.

270. Achlyodes ecliptica, n. sp.

Primaries sericeous-grey; two black bands across the basal area, the second forming an angulated fork which crosses the end of the cell; an elbowed discal black band, above which is a subcostal spot; a lunulated submarginal black band, ending in a short black bar at external angle; secondaries sericeous-grey, crossed by two curved central bands of black; outer border rather broadly black; body blackish; wings below purplish, transverse bands less strongly defined; costal area of primaries between the bands pale grey towards apex; marginal border of secondaries replaced by a submarginal series of lunate black spots: expanse of wings 1 inch 7 lines.

Rio Tapajos, 11th January; Pariti, Rio Purus, on edge of river, 5th October, 1874.

Digitized by Google

271. Achlyodes exosa, n. sp.

♂. Primaries brown, with the base, two central interrupted elbowed oblique bands from costa to inner margin, and an ill-defined submarginal streak, black; secondaries black, with traces of two or three diffused brown bands on costal area; body black; wings below chocolate-brown; secondaries crossed by two curved central darker bands: expanse of wings 1 inch 2 lines.

♀ ? Wings above chocolate-brown, a curved greyish streak intersected by a line of the ground colour beyond the cell of primaries: wings below chocolate-brown; secondaries crossed by several darker lines: expanse of wings 1 inch 1 line.

♂. Forest at St. Vicenzio, Rio Purus, 22nd September; Uttary, Rio Purus, 25th September, 1874.

The female was taken at light!

Allied to *A. tetrastigma.*

272. Achlyodes nyctineme (Boisd. in litt.).

♂. Wings above dark olive-brown, fringe grey; primaries with three white dots beyond the cell; a sub-basal transverse band, two bands united upon the inner margin, thence diverging, and elbowed near the costa, the outer one limited by the white dots, and a submarginal macular streak, black-brown; secondaries with a spot in the cell, two irregularly arched transverse central bands, and a submarginal macular streak, black-brown; wings below nearly as above, but the markings less strongly defined: expanse of wings 1 inch 4 lines.

♀. Redder and smaller than the male, the bands and spots broader: expanse of wings 1 inch 2 lines.

♀. Rio Trombetas, 30th January, 1874. ♂. Pará, 2nd March, 1875.

Allied to *Helias pyralina,* Moeschler.

Antigonus, *Hübner.*

273. Antigonus erosus.

Urbanus vetus erosus, Hübner, Samml. Exot. Schmett. (1806—16).

♂. Obydos, 23rd January, 1874.

Tagiades, *Hübner.*

274. Tagiades astrigera, n. sp.

Wings above deep brown, primaries with a dot below the origin of the first median branch; three in an oblique

Digitized by Google

series from the costa across the cell, and a deeply waved series of nine across the disc, hyaline white; secondaries with a dot at end of cell, and a circular series round it, pale brown; body dark brown above; palpi yellow at the sides; pectus grey; venter sandy whitish, brown at the sides: primaries below with a submarginal series of testaceous dots, otherwise as above; secondaries with the dots testaceous, otherwise as above: expanse of wings 1 inch 11 lines.

Uricurituba, Rio Tapajos, 17th March, 1874.

Two examples were obtained of this remarkable New World representative of the Old World genus *Tagiades*.

DESCRIPTION OF PLATE III.

Fig. 1. Stalachtis Trailii, p. 137.
„ 2. Eubagis limbata, p. 117.
„ 3. Eubagis niveata, p. 116.
„ 4. Echenais mollis, p. 133.
„ 5. Papilio opalinus, p. 145.
„ 6. Tmolus clitumnus, p. 140.
„ 7. Ceratinia castanea, p. 109.
„ 8. Mechanitis pannifera, p. 109.

Digitized by Google

X. *Descriptions of new genera and of uncharacterized species of* Halticinæ. By Joseph S. Baly, F.L.S.

[Read 4th April, 1877.]

List of Species.

Nisotra Breweri	Australia.
Arsipoda hæmatodera	„
„ cæruleata	„
Crepidodera africana	Camaroons.
„ japonica	Japan.
„ costipennis	Borneo.
„ collaris	Shanghai.
„ parallela	Australia.
„ vestita	„
Haltica amazona	Pará.
Sebæthe nigricornis	Cambodia.
„ fulvipennis	Birmah.
„ torrida	Sierra Leone.
Leptophysa (n. g.) Batesii	Pará.
Chætocnema natalensis	Port Natal.
„ Wollastoni	Cape of Good Hope.
„ persica	Persia.
„ cognata	India.
„ squarrosa	„
„ Bretinghami	„
„ concinnipennis	„
„ Wallacei	Malacca.
„ robusta	Brazil.
„ clypeata	Pará.
„ mexicana	Teapa.
„ megalopoides	Australia.
„ fuscomaculata	„
„ carinata	„
„ submetallescens	„
„ Erichsoni	„
Stenophyma (n. g.) elegans	Brazil.
Longitarsus amazonus	Pará.
„ scutellatus	Australia.
Aphthona Wallacei	Flores.
Phyllotreta orientalis	Kurdistan.
„ Cumingii	Manilla.
Sphæroderma ornata	Cambodia.
„ apicipennis	Borneo.
Argopus Fortunei	N. China.
Stegnaspea (n. g.) Trimeni	Cape of Good Hope.
Dibolia Duboulayi	Australia.
Psylliodes Chapuisii	Tringanee.

Genus Nisotra, Baly.

Nisotra Breweri.

Ovata, convexa, flavo-testacea, nitida, antennis, basi

Digitized by Google

exceptis, nigris; elytris viridi-cæruleis, metallicis, substriatim punctatis.

Long. 1¾ lin.

Hab.—Australia, Rockhampton.

Vertex smooth, impunctate; encarpæ ill-defined, linear, oblique, not contiguous; carina obsolete; eyes and apex of jaws black; antennæ half the length of the body, four lower joints flavo-testaceous, the fifth piceous, the rest black. Thorax nearly three times as broad as long; sides rounded, nearly parallel, all the angles produced slightly outwards, acute; upper surface convex, minutely punctured, sides thickened; anterior border impressed on either side, at some distance from the lateral margin, with a short notch. Elytra more strongly punctured than the thorax, punctures on the outer disk arranged in double striæ; interspaces impressed with punctures of equal size to those on the striæ, rendering the latter obscure; on the outer side, near the lateral margin, are three or four slightly-raised vittæ.

Genus Arsipoda, Erichs.

Arsipoda hæmatodera.

Elongato-ovata, modice convexa, nigra, nitida, thorace lævi, rufo-testaceo, pedibus piceis; capite (antennis exceptis), scutello elytrisque nigro-æneis; his confuse, tenuiter punctatis.

Long. 2¼ lin.

Hab.—Western Australia, Swan River.

Head with the vertex shining, very finely wrinkled, front separated on either side from the lower face by an oblique groove; encarpæ oblong, oblique, ill-defined, not contiguous; carina broad, scutate, sides of the clypeus obscure rufous; antennæ half the length of the body, four lower joints rufous, stained above with piceous; jaws and labrum also piceous. Thorax more than twice as broad as long; sides straight and parallel at the base, rounded and converging in front, hinder angles rectangular, acute, the anterior ones thickened, obtuse; upper surface transversely convex, smooth and shining, faintly impressed with minute shallow punctures, only visible in certain lights under a strong lens; basal groove obsolete. Scutellum trigonate. Elytra broader than the thorax, oblong, attenuated towards the apex; surface faintly wrinkled, finely punctured; on the middle disk are some faint traces of

Digitized by Google

longitudinal striæ. Legs rufo-piceous, four hinder thighs stained above with piceous.

Very nearly allied to *A. fulvicollis;* it differs in the more finely punctured elytra and in the almost entire absence of the longitudinal striæ on their surfaces; it also differs in the short scutate carina, this part of the face in the older species being longer and pyriform.

Arsipoda cæruleata.

Subelongato-ovata, modice convexa, metallico-cærulea, nitida, subtus cæruleo-nigra, antennis (basi fulvâ exceptâ) nigris; thorace lævi, vix punctato, basi sulco transverso, utrinque longe ante marginem desinente, instructo; elytris oblongis, infra basin leviter depressis, tenuiter striatim punctatis, punctis in striis confusis dispositis.

Long. 1½ lin.

Hab.—Western Australia (Duboulay).

Vertex smooth and shining, impunctate; front impressed on either side, above the encarpæ, with several deep foveæ; encarpæ well defined, transverse, subpyriform, nearly contiguous; carina rhomboidal, extended anteriorly to the front edge of the clypeus; antennæ more than half the length of the body, four lower joints fulvous, stained with piceous, the rest black. Thorax two-thirds broader than long; sides rounded, scarcely converging in front, the hinder angle produced into an acute tooth, the anterior one thickened, subacute; upper surface convex, rather sparingly impressed with minute punctures, only visible under a lens; basal surface impressed with a broad well defined transverse sulcation, which terminates abruptly on either side, at some distance from the lateral margin; anterior border of the groove sinuate. Scutellum trigonate. Elytra broader than the thorax, oblong, faintly depressed below the basilar space, finely striate-punctate, the punctures irregularly placed on the striæ; interspaces plain, very finely but not closely punctured. Hinder thigh moderately thickened, hinder tibia nearly straight, its outer edge not longitudinally grooved.

Genus CREPIDODERA, Chevr.

Crepidodera africana.

Ovata, convexa, piceo-fulva, nitida, pectore abdomineque piceis; thorace convexo, sulco basali profunde impresso,

Digitized by Google

fere ad marginem lateralem producto; elytris infra basin transversim excavatis, sat fortiter punctato-striatis, interspatiis externis convexiusculis, callo humerali prominulo.

Long. ¾ lin.

Hab.—Guinea, Camaroons.

Head triangular, vertex smooth, impunctate; encarpæ small, subovate, contiguous, carina linear; antennæ about half the length of the body, rather longer in the ♂, slightly thickened towards the apex. Thorax rather more than half as broad again as long at the base; sides straight, diverging from base to apex, anterior angles thickened, obtusely truncate, slightly oblique; hinder margin sinuate on either side the medial lobe, the latter produced, subacutely rounded; above convex, disk smooth, nearly impunctate, only a few faint impressions being visible under a lens; basal groove deep, slightly sinuate in the middle, not abruptly terminating on the sides, but extending nearly to the lateral border of the thorax; its surface impressed with a single row of punctures. Scutellum transverse, semirotundate. Elytra much broader than the thorax, broadly ovate, convex, excavated transversely below the basilar space, the latter distinctly raised; humeral callus thickened, prominent; surface rather strongly punctate-striate, the interspaces impunctate, those near the outer margin thickened, convex.

Crepidodera japonica.

Elongata, convexa, supra viridi-ænea, nitida, antennis (basi fulvâ exceptâ) nigris; subtus æneo-nigra, pedibus piceis, tibiis tarsisque pallidioribus; thorace fortiter et irregulariter punctato; elytris fortiter punctato-striatis, interspatiis convexiusculis, ad latera et ad apicem convexis.

Mas.—Antennarum articulo quarto elongato, ad apicem incrassato.

Long. 1¾ lin.

Hab.—Japan, Hakodate; ♂ in Mr. Lewis' collection, the ♀ in my own.

Head rugose-punctate, carina raised, linear; encarpæ well defined, oblique, contiguous; antennæ more than half the length of the body, 4th joint in the ♂ one-half longer than the 3rd, thickened and subclavate; not thickened and equal in length to the 3rd in the ♀; three or four lower joints fulvous, the rest black. Thorax nearly one-half

Digitized by Google

broader than long; sides straight and parallel, rounded and converging in front, anterior angle thickened, obtuse; above strongly punctured, the punctures arranged irregularly over the surface; basal groove straight, well defined, terminated at either end by a perpendicular impression, which extends to the basal margin; space between these impressions depressed. Scutellum smooth, trigonate. Elytra narrowly oblong, broader than the thorax, parallel, convex, faintly excavated and indistinctly wrinkled below the basilar space; regularly punctate-striate, interspaces scarcely thickened on the inner disk, convex on the sides and apex; when viewed under a lens, minutely but not closely punctured.

Crepidodera costipennis.

Ovata, convexa, obscure cuprea, tibiis anticis antennisque obscure fulvis, his ad apicem piceis; thorace irregulariter granuloso-strigoso, minus remote, sat fortiter punctato; elytris infra basin obsolete transversim depressis, fortiter punctato-striatis, interstitiis costatis, sub lente strigoso-reticulatis.

Long. 1 lin.

Hab.—Borneo; collected by Mr. Wallace.

Head short, subrotundate; vertex granulose-strigose, subremotely punctured, separated from the eyes and lower face by a deep groove; encarpæ linear, oblique, not distinctly separated from the interocular spaces; carina oblong, ill-defined. Thorax twice as broad at the base as long, basal margin sinuate on either side the medial lobe, the latter produced, subacutely rounded; lateral margin nearly straight, obliquely narrowed from base to apex, anterior angles thickened, obliquely truncate; upper surface irregularly granulose-strigose, strongly but not very closely punctured; basal groove ill-defined. Elytra strongly punctate-striate, striæ sulcate, interspaces costate, faintly reticulate-strigose.

Crepidodera collaris.

Ovata, convexa, nigra, nitida, thorace capiteque rufotestaceis; antennis basi fulvis, extrorsum nigris; pedibus obscure fulvis, femoribus posticis nigris, tibiis tarsisque ejusdem paris piceis; thorace fere impunctato, sulco basali

Digitized by Google

obsoleto; elytris tenuiter punctato-striatis, interstitiis lævibus.

Long. 1 lin.

Hab.—Shanghai (Lewis).

Encarpæ not defined; carina linear, slightly raised; eyes large, black; vertex smooth, impunctate; antennæ with the 2nd joint two-thirds the length of the 1st; 3rd and 4th equal, each rather longer than the 2nd; three lower joints fulvous; 4th and 5th piceous, the rest black. Thorax two-thirds broader than long; sides parallel, slightly rounded, anterior angles obliquely truncate; above convex, smooth and shining, minutely and remotely punctured. Scutellum smooth, semiovate. Elytra much broader than the thorax, finely punctate-striate; interspaces smooth, each with a single row of very fine punctures, only visible under a deep lens.

Crepidodera parallela.

Elongata, parallela, fulva, nitida, antennis extrorsum piceis, pedibus elytrisque infuscatis, his æneo vix micantibus, subdepressis, infra basin transversim excavatis, fortiter punctato-striatis; thorace lævi, basi sulco profundo, utrinque abbreviato, fortiter punctato, instructo.

Long. $1\frac{5}{8}$ lin.

Hab.—Sydney.

Vertex smooth, impunctate; front coarsely punctured on either side within the eye; encarpæ contiguous; carina elongate, its apex hastate; antennæ more than half the length of the body, four lower joints piceo-fulvous, the rest nigro-piceous. Thorax one-third broader than long at the base; sides slightly diverging and slightly sinuate from the base to beyond the middle, thence rounded and converging to the apex; anterior angles thickened, curved slightly outwards, broadly truncate; hinder angles nearly rectangular, acute; sides smooth, nearly impunctate, basal groove abbreviated on either side at some distance from the lateral margin, deeply and coarsely punctate. Elytra impressed below the basilar space and also within the humeral callus, the latter thickened; surface strongly punctate-striate, interspaces smooth, impunctate.

Crepidodera vestita.

Elongata, subcylindrica, flava, nitida, antennis extrorsum abdomineque piceis; thorace sat remote, fortiter

Digitized by Google

punctato, sulco basali leviter impresso; elytris infra basin non depressis, regulariter punctato-striatis, pube suberectâ albidâ sat parce vestitis.

Long. ⅔ lin.

Hab.—South Australia, Gawler Town.

Head exserted; vertex smooth, impunctate; encarpæ thickened, contiguous; eyes ovate, prominent, black; antennæ robust, nearly three-fourths the length of the body, slightly thickened towards the apex, the seven outer joints more or less stained with piceous; 1st and 2nd joints thickened, the latter distinctly longer than the 3rd. Thorax about one-third broader than long; sides straight and diverging from the base to beyond the middle, anterior angles produced into a small acute tooth; basal margin transversely truncate; upper surface moderately convex, coarsely but distantly punctured, basal groove only slightly impressed, closely covered with coarse punctures. Scutellum smooth, trigonate. Elytra broader than the thorax, oblong, parallel, their apices conjointly acutely rounded; above moderately convex, not depressed below the basilar space, regularly punctate-striate; interspaces smooth, impunctate; surface rather sparingly clothed with coarse suberect whitish hairs. Body beneath sparingly clothed with suberect hairs. Abdomen smooth and shining, impunctate, more or less stained with piceous, apices of claws also piceous. Upper surface of hinder pair of tibiæ not longitudinally grooved.

Genus HALTICA, Geoffroy.

Haltica amazona.

Anguste oblongo-ovata, convexa, nigra, nitida, femoribus anticis quatuor, capite, antennis basi thoraceque rufo-testaceis, elytris viridi-metallicis.

Long. 1½ lin.

Hab.—Pará, Santarem.

Head smooth, impunctate; encarpæ remote, trigonate, carina linear; four lower joints of antennæ rufo-testaceis, the rest black. Thorax one-third broader than long, sides straight and parallel at the base, rounded and converging in front; basal margin straight on either side, medial lobe very slightly produced, very obtusely rounded; disk convex, impunctate, impressed in front of the basal margin with a deep transverse groove, which extends entirely across the surface; on either side, at some distance from the outer

Digitized by Google

margin, is a short ill-defined longitudinal impression, which extends backwards from the transverse groove nearly to the basal margin. Elytra broader than the thorax, sides slightly rounded, subparallel; above convex, not impressed below the base, finely but distinctly punctulate.

Genus Sebæthe, Baly.

Sebæthe nigricornis.

Rotundato-ovata, modice convexa, pallide fulva, nitida, oculis antennisque (his basi exceptis) nigris; thorace lævi, fere impunctato; elytris tenuissime, subremote punctatis.

Long. 2 lin.

Hab.—Cambodia.

Vertex smooth, impunctate; front impressed on either side, just above the upper and outer angle of the encarpa, with a single deep fovea; encarpæ transverse, well defined, subquadrate, contiguous; carina strongly raised between the antennal cavities, its upper portion linear; antennæ three-fourths the length of the body, three lower joints fulvous, the rest black. Thorax more than three times as broad as long; sides broadly reflexed, rounded and diverging at the base, thence obliquely converging and slightly rounded to the apex, apical angle thickened, obtuse, the hinder one nearly obsolete, very obtuse; upper surface smooth, impunctate. Scutellum large, trigonate, its apex rounded. Elytra broadly ovate, broadly rounded at the apex, their surfaces minutely but not closely punctured; the punctures only visible under a strong lens.

Sebæthe fulvipennis.

Oblongo-ovata, modice convexa, nigra, nitida, antennarum basi, ore, scutello thoracisque lateribus reflexis fulvo-piceis, vertice obscure piceo; elytris fulvis, tenuiter punctatis.

Long. $1\frac{3}{4}$ lin.

Hab.—Birmah.

Vertex smooth, impunctate; encarpæ subquadrate, well defined, contiguous; carina raised, linear; antennæ rather more than half the length of the body, two lower joints obscure fulvous, the rest black. Thorax more than three times as broad as long; sides broadly reflexed, rounded and converging from base to apex; anterior angles produced, thickened, obtuse, the hinder acute; basal margin slightly

Digitized by Google

bisinuate on either side, its medial portion obtuse; upper surface impressed, but not closely, with minute punctures; reflexed lateral margin piceo-fulvous. Scutellum trigonate. Elytra broadly oblong-ovate, regularly rounded at the apex, moderately convex, distinctly margined, finely but distinctly punctured. Penultimate joint and claw of the four anterior tarsi obscure piceous.

Sebæthe torrida.

Regulariter oblongo-ovata, modice convexa, rufo-fulva, nitida, subtus cum antennis fulva; thorace elytrisque subremote, tenuiter punctatis.

Long. $2\frac{2}{3}$ lin.

Hab.—Sierra Leone.

Vertex smooth, impunctate; encarpæ well defined, quadrate, contiguous; carina raised, linear, thickened between the insertion of the antennæ; maxillary palpi rotundate-ovate, acute; antennæ filiform, three-fourths the length of the body, entirely fulvous. Thorax nearly three times as broad as long; sides somewhat broadly rounded, slightly converging in front; anterior angles produced, thickened, obtuse, hinder ones produced laterally into an acute tooth; upper surface finely but distantly punctured. Elytra rather broader than the thorax, oblong, their apices regularly rounded; above moderately convex, the sides distinctly margined, rather more closely punctured than the thorax.

Genus Leptophysa.

Corpus elongatum, angustatum, convexum, dorso paullo depressum, parce setosum. *Caput* exsertum; *facie* perpendiculari, inter oculos elevatâ; *encarpis* contiguis; *carinâ* elevatâ, lineariformi; *antennis* filiformibus. *Thorax* transverso-quadratus, paullo convexus, basi leviter transversim sulcatus. *Elytra* thorace latiora, parallela, modice convexa, punctato-striata. *Pedes* sat graciles; *coxis* anticis ovatis, prosterno fere æquialtis; *femoribus* posticis modice incrassatis; *tibiis* simplicibus, dorso non canaliculatis, quatuor anticis muticis, posticis apice spinâ acutâ armatis; *unguiculis* appendiculatis. *Prosternum* convexum, inter coxas angustatum, apice dilatatum, truncatum; *acetabulis* anticis vix apertis.

Digitized by Google

Leptophysa Batesii.

Elongata, modice convexa, dorso paullo complanata, obscure cuprea, parce setosa, subtus picea, pedibus (femoribus posticis apice exceptis) flavis; antennis nigris, basi fulvis.

Long. 1 lin.

Hab.—Pará.

Head subtrigonate; encarpæ contiguous, subtrigonate; antennæ more than three-fourths the length of the body, basal joint incrassate, about equal in length to the third, second slightly incrassate, shorter than the third; four lower joints pale piceo-fulvous, the basal one stained above with piceous. Thorax rather more than one-half as broad again as long; sides straight and parallel, slightly converging at the apex, anterior angle scarcely produced, obtuse, hinder angle acute; basal margin nearly straight, slightly sinuate on either side; above transversely convex, coarsely but remotely punctured; basal groove straight, shallow, ill-defined, abbreviated on either side before reaching the lateral margin. Elytra broader than the thorax, parallel, moderately convex, faintly depressed below the basilar space, regularly punctate-striate, sparingly clothed with griseous hairs.

Genus Chætocnema, Stephens.

Baron von Harold in the last volume of his Catalogue points out that *Chætocnema*, Stephens, has the priority of *Plectroscelis*, Redt.; the latter name, therefore, although universally of late years used by Entomologists, must fall.

Chætocnema natalensis.

Elongato-ovata, convexa, cupreo- aut viridi-ænea, nitida; antennis (basi piceâ exceptâ) nigris; subtus nigra, æneo vix micans; thorace transverso, minus fortiter, subcrebre punctato, utrinque basi sulco brevi perpendiculari impresso; elytris fortiter punctato-striatis, interspatiis distincte punctatis, ad latera et ad apicem convexiusculis, infra basin obsolete transversim rugulosis.

Long. 1½—2¼ lin.

Hab.—Port Natal.

Vertex and front finely granulose-reticulate, impressed here and there on the upper face with a few distinct punctures; front separated from the lower face by a deep

Digitized by Google

groove; clypeus coarsely rugose-punctate; carina linear; encarpæ obsolete; antennæ rather more than half the length of the body, four lower joints rufo-piceous, the rest black. Thorax nearly three times as broad as long; sides nearly straight and parallel at the base, thence converging and slightly rounded to the apex; anterior angle thickened, produced into an obtuse tooth, hinder angle nearly rectangular, acute; upper surface transversely convex, rather deeply impressed with moderate-sized punctures, their interspaces smooth and shining, impunctate. Scutellum semirotundate. Elytra broader than the thorax, oblong, convex, strongly punctate-striate; interspaces distinctly punctured, plane on the inner disk, slightly convex on the sides and apex, faintly wrinkled here and there below the base.

Similar in form and size to *C. chalcea*, v. Harold, but differing in the presence of the two short perpendicular grooves at the base of the thorax, together with the different coloration of the antennæ and legs.

Chætocnema Wollastoni.

Ovata, convexa, cuprea, nitida, antennis pedibusque rufo-piceis, illis extrorsum femoribusque piceis; capite thoraceque sat fortiter, minus remote punctatis; elytris sat fortiter punctato-striatis, interstitio primo confuse punctato.

Long. 1¼ lin.

Hab.—Cape of Good Hope.

Head subtrigonate, strongly punctured, encarpæ and carina entirely obsolete; vertex broad, separated from the eyes and lower face by an ill-defined sutural line; labrum nigro-piceous; antennæ about half the length of the body, slender, five outer joints piceous. Thorax nearly twice as broad as long at the base; sides rounded and converging from the base to the apex, anterior angles slightly produced, obtuse; surface deeply but not very closely punctured, interspaces shining, impunctate. Elytra strongly punctate-striate; interspaces smooth, impunctate, first interspace next the suture irregularly punctured.

Chætocnema persica.

Elongata, postice paullo attenuata, convexa, cuprea, nitida, subtus obscurior, pedibus (femoribus posticis exceptis) antennisque fulvis, his sæpe extrorsum infuscatis;

Digitized by Google

capite thoraceque granuloso-punctatis, hoc utrinque sulco basali perpendiculari brevi impresso, sat tenuiter, subremote punctato; elytris fortiter punctato-striatis, interspatiis tenuissime leviter transversim rugulosis, tenuiter punctatis, interspatio primo confuse, fortiter punctato.

Long. $1\frac{2}{3}$ lin.

Hab.—Persia.

Head finely granulose, impressed on either side above the eye with a few irregular punctures; front distinctly separated from the face; encarpæ obsolete; interocular spaces deeply punctured; carina linear, its apex bounded on either side by a triangular depression; eyes large; antennæ nearly two-thirds the length of the body, five or six outer joints sometimes stained with fuscous. Thorax nearly twice as broad at the base as long; sides straight, converging from base to apex; hinder angles acute, the anterior thickened, subacute; above transversely convex, finely granulose, finely and subremotely but distinctly punctured; on either side at the base is a short slightly curved perpendicular groove. Scutellum semirotundate. Elytra scarcely broader than the thorax at the base, attenuated towards the apex, strongly punctate-striate; interspaces faintly transversely rugulose, minutely but not closely punctured, short interspace next the suture impressed with coarse punctures, equal in size to those on the striæ. Tooth on the hinder tibia broad, extending entirely across the outer surface of the limb, compressed, its apex transversely truncate.

Nearly allied to *C. major;* narrower, more attenuated posteriorly; the thorax narrower, less strongly punctured and with straighter sides; the first interspace on the elytron in the present species is also coarsely punctured. Both species may be known from *C. chlorophana* by the form of the tooth on the hinder tibia; in *C. chlorophana* it is placed on the outer edge of the dorsal surface of the tibia, is compressed laterally and its apex is acute; in the two other species it is broad, compressed transversely, and its apex is transversely truncate.

Chætocnema cognata.

Ovata, convexa, cuprea, nitida, pedibus antennisque fulvis, his extrorsum femoribusque posticis piceis; thorace reticulato-granuloso, minus fortiter, subremote punctato;

Digitized by Google

elytris sat fortiter punctato-striatis, striâ 1mâ confuse punctatâ; interspatiis convexiusculis.

Long. 1 lin.

Hab.—India (Bretingham).

Head subrotundate; vertex and front granulose-reticulate, deeply but not very closely punctured; face broad, convex between the eyes, the latter widely separated; clypeus rugose-punctate; carina linear, ill-defined; encarpæ obsolete; labrum large, transverse, shining black, its anterior surface obliquely deflexed; antennæ half the length of the body, five lower joints fulvous, the rest piceous. Thorax twice as broad as long; sides straight and parallel at the base, rounded and converging in front; hinder angles acute, the anterior thickened, obliquely truncate; above convex, subcylindrical in front, finely reticulate-granulose, impressed with moderately-sized punctures, more remote and finer on the disk, coarser and more crowded on the sides. Scutellum trigonate. Elytra broadly ovate, slightly attenuated at the apex, the latter acutely rounded; convex, strongly punctate-striate, the puncturing on the stria next the suture less regular than on the others; interspaces slightly convex, very finely granulose-reticulate, impunctate, with the exception of the short interspace next the suture, which is coarsely punctured.

Chætocnema squarrosa.

Breviter ovata, convexa, cuprea, minus nitida, pedibus antennisque basi piceo-fulvis, his extrorsum femoribusque posticis piceis; thorace granuloso, minus fortiter punctato; elytris fortiter punctato-striatis, interspatiis leviter convexiusculis, tenuissime granulosis, interspatio primo confuse punctato.

Long. $\frac{5}{6}$ lin.

Hab.—India; collected by Mr. Bretingham.

Head granulose, distinctly but not closely punctured; encarpæ and carina obsolete; antennæ less than half the length of the body; six lower joints obscure fulvous, the rest nigro-piceous. Thorax twice as broad as long; sides straight and parallel behind the middle, rounded and converging in front, anterior angles slightly thickened, obtuse; above transversely convex, subcylindrical in front; minutely granulose, distinctly but not very closely punc-

Digitized by Google

tured. Scutellum trigonate, its apex obtuse. Elytra broader than the thorax, broadly oval, attenuated towards the apex; surface very minutely granulose, regularly punctate-striate, interspaces very slightly convex, more distinctly so on the outer margin, impunctate; the one next the suture impressed with large punctures, equal in size to those on the striæ.

Chætocnema Bretinghami.

Anguste ovata, convexa, cuprea, nitida, æneo-micans, pedibus antennisque sordide fulvis, his extrorsum femoribusque posticis piceis; thorace fortiter punctato; elytris sat profunde punctato-striatis, striis sulcatis; interspatiis convexis, ad latera et ad apicem costatis; interstitio primo confuse punctato.

Long. 1¼ lin.

Hab.—India, collected by Mr. Bretingham, after whom I have named the species.

Head small, rotundate, strongly pnnctured; carina and encarpæ obsolete; antennæ slender, half the length of the body, six lower joints obscure fulvous, the rest pale piceous. Thorax twice as broad as long at the base; sides rounded and converging from base to apex, the hinder angles nearly rectangular, acute, anterior ones thickened, obtuse; above convex, subcylindrical at the apex, surface strongly and closely punctured, the punctures rather more distant on the middle of the disk. Scutellum transverse, semi-rotundate. Elytra ovate, attenuated towards the apex, strongly and deeply punctate-striate; interspaces convex, costate on the sides and at the apex, interspace next the suture closely impressed with punctures equal in size to those of the striæ; the other interspaces smooth, impunctate.

Chætocnema concinnipennis.

Ovata, convexa, cuprea, nitida, pedibus antennisque obscure rufo-fulvis, his extrorsum piceis, femoribus posticis extus piceo-cupreis; thorace fortiter, sat crebre punctato, interstitiis ad latera laxe elevato-reticulatis; elytris concinne punctato-striatis, interspatiis ad latera subcostatis.

Long. 1 lin.

Hab.—India; collected by Mr. Bretingham.

Head subrotundate; vertex and front granulose, im-

Digitized by Google

pressed, but not closely, with distinct punctures; clypeus rugose-punctate, clothed with white hairs; carina and encarpæ obsolete; labrum broad, shining black; antennæ scarcely more than half the length of the body, six lower joints obscure rufo-fulvous, the rest piceous. Thorax twice as broad as long; sides nearly parallel at the base, rounded and converging in front, anterior angles thickened, the hinder one acute; above convex, subcylindrical towards the apex, covered with deep, strong punctures; interspaces on the sides loosely elevate-reticulate. Scutellum broader than long, its apex rounded. Elytra broadly ovate, slightly attenuated at the apex, the latter subacutely rounded; above convex, the humeral callus thickened; surface closely covered with regular, strongly punctured longitudinal striæ, the interspaces near the outer margin subcostate.

Chætocnema Wallacei.

Elongata, subcylindrica, picea, nitida, supra cuprea, pedibus (femoribus posticis exceptis) antennisque obscure fulvis, his apice nigro-piceis; thorace fortiter punctato; elytris sat profunde punctato-striatis; punctis in striâ 1mâ confuse dispositis; interspatiis convexis, ad latera costatis.

Long. 2 lin.

Hab.—Malacca, Mount Orphir; collected by Mr. Wallace.

Head short, subtrigonate; vertex minutely granulose-strigose, impressed on either side above the eye with several irregular foveæ; encarpæ obsolete; carina scarcely raised, narrowly oblong, clypeus on either side coarsely punctured; antennæ with the eight lower joints obscure fulvous, the three upper ones nigro-piceous. Thorax twice as broad at the base as long; sides straight, slightly converging from base to apex, the anterior angles thickened, obliquely truncate; surface very minutely granulose, deeply but not very closely punctured. Scutellum scarcely broader than long, trigonate, its apex rounded. Elytra oblong, coarsely and deeply punctate-striate, the puncturing on the short stria next the suture irregular; interspaces, when seen under a lens, very finely and remotely punctured, convex, costate near the outer margin.

Chætocnema robusta.

Late ovata, convexa, picea, nitida, pedibus antennisque

Digitized by Google

fulvo-piceis, his basi tarsisque fulvis; thorace (sub lente) obsoletissime punctato; elytris regulariter punctato-striatis, interspatiis planis; interspatio externo paullo incrassato.

Long. 1¼ lin.

Hab.—Brazil.

Vertex and front smooth, impunctate, the latter separated from the lower face by a deep groove, which extends upwards on either side along the inner and upper margins of the eye; encarpæ and carina obsolete; interocular spaces triangular, smooth, impunctate; antennæ more than half the length of the body, fulvous, five or six outer joints stained with piceous; 2nd joint shorter than the 3rd, thickened, subovate. Thorax nearly twice as broad as long at the base; sides nearly straight, slightly converging from base to apex, the anterior angles obtuse; upper surface shining, faintly but somewhat closely impressed with small, shallow, oblong punctures, only visible under a lens; basal margin bordered by a single row of larger punctures. Elytra broader than the thorax, regularly punctate-striate, interspaces impressed with very fine punctures, plane, the one on the outer margin thickened.

Chætocnema clypeata.

Ovata, convexa, cuprea, nitida, antennis nigris, his basi, tibiis, tarsisque fulvis, femoribus quatuor anticis piceis; capite thoraceque granulosis, distincte subremote punctatis; illo magno, clypeo fortiter et crebre punctato; elytris fortiter punctato-striatis.

Long. 1 lin.

Hab.—Pará.

Head broad, trigonate; vertex and front granulose, distinctly but not closely punctured; encarpæ and carina entirely obsolete; clypeus with its hinder apex broadly truncate, separated from the front by a transverse groove, which extends entirely across between the antennal cavities; its surface plane, coarsely and deeply punctured, clothed with adpressed whitish hairs; labrum large, piceo-cupreous; cheeks below the eyes coarsely punctured; antennæ half the length of the body, six lower joints fulvous, the rest black. Thorax nearly twice as broad as long; sides nearly straight and parallel, anterior angles thickened, obliquely truncate; upper surface transversely convex, subcylindrical, subremotely punctured, the interspaces granulose-punctate. Scutellum transverse, impunctate. Elytra broader than

Digitized by Google

the thorax; sides obliquely converging from the middle to the apex, the latter conjointly subacutely rounded; upper surface strongly and regularly punctate-striate; interspaces (when seen under a deep lens) minutely granulose-reticulate; interspace next the suture impunctate.

Chætocnema mexicana.

Elongato-ovata, convexa, cuprea, nitida, pedibus antennisque pallide fulvis, harum articulis quatuor ultimis piceis, femoribus posticis infuscatis; thorace granuloso, subremote punctulato; elytris sat fortiter punctato-striatis, interstitiis lævibus.

Long. $\frac{2}{3}$ lin.

Hab.—Mexico, Teapa; collected by M. Pilate.

Vertex and front finely granulose-reticulate, separated from the eyes and lower face by a deep groove; encarpæ and carina entirely obsolete; interocular space smooth, impunctate. Thorax more than one-half broader than long; sides straight and parallel, anterior angles thickened, obliquely truncate; above granulose-reticulate, subremotely punctulate. Elytra broader than the thorax, ovate, acutely rounded at the apex, regularly punctate-striate, interspaces impunctate.

Chætocnema megalopoides.

Elongata, convexa, pallide piceo-ænea, nitida, subtus picea, pedibus antennisque fulvis, his extrorsum femoribusque posticis pallide piceis; capite valde exserto, fortiter punctato; thorace subcylindrico, fortiter punctato; elytris sat profunde punctato-striatis, interspatiis ad latera et ad apicem convexis.

Long. $1\frac{1}{4}$ lin.

Hab.—Australia, Rockhampton.

Head strongly exserted, neck cylindrical; vertex and front convex, strongly but not closely punctured; eyes lateral, rotundate, space between the eyes swollen; interocular spaces coarsely punctured; carina oblong, not extending to the anterior border of the clypeus; labrum very broad; antennæ three-fourths the length of the body, six lower joints pale fulvous, the rest piceous. Thorax scarcely twice as broad as long; sides distinctly margined, slightly rounded, scarcely converging in front, hinder angles rounded, the anterior produced laterally into an acute tooth; above subcylindrical, strongly but not very

Digitized by Google

closely punctured. Scutellum semirotundate. Elytra broader than the thorax, narrowly oblong, convex, the humeral callus thickened; surface strongly punctate-striate; the interspaces nearly plane near the suture, convex towards the sides and apex.

Chætocnema fuscomaculata.

Elongato-ovata, modice convexa, fulva, nitida, capite, thorace, scutello pectoreque fuscis; thorace fortiter punctato; elytris fortiter punctato-striatis, interspatiis convexiusculis, parce, tenuiter punctatis; utrisque maculâ humerali alterâque vix pone medium, transversâ, pallide fuscis instructis.

Long. 1¼ lin.

Hab.—Western Australia; collected by Mr. Duboulay.

Head rugose-punctate; encarpæ and carina obsolete; antennæ more than half the length of the body, four lower joints fulvous, the rest pale fuscous. Thorax more than twice as broad as long; sides straight and parallel, rounded and converging in front; surface transversely convex, coarsely and rather closely punctured. Scutellum trigonate-ovate, its apex rounded. Elytra rather broader than the thorax, oblong-ovate, slightly flattened along the suture, strongly punctate-striate; interspaces convex, finely but not closely punctured.

Chætocnema carinata.

Elongato-ovata, convexa, fusco-ænea, nitida, antennis piceis, extrorsum nigro-piceis; capite exserto, brevi, rotundato, rugoso-punctato, clypeo brevi, medio longitudinaliter carinato; thorace fortiter punctato; elytris infra basin foveâ magnâ, leviter impressâ, instructis; fortiter punctato-striatis, interspatiis convexiusculis, ad latera et ad apicem convexis.

Long. 1⅓ lin.

Hab.—Western Australia.

Head slightly broader than long, rotundate; vertex and front granulose, impressed in the middle with large scattered punctures, rugose on the sides; encarpæ obsolete; interocular spaces coarsely punctured; clypeus very short, transverse, coarsely punctured on the sides; carina linear, distinct and extending across the clypeus from base to apex; antennæ nearly two-thirds the length of the body; labrum very broad, short, entirely concealing the

Digitized by Google

mandibles when viewed from above, and when the latter are closed. Thorax twice as broad as long at the base, broader in front; sides diverging from the base to beyond the middle, thence rounded and converging to the apex; hinder angles slightly produced, acute, anterior ones thickened, obtuse, somewhat recurved; upper surface transversely convex, coarsely and deeply punctured. Scutellum trigonate, its apical angle rounded. Elytra broader than the thorax, oblong-ovate, convex, each impressed below the basilar space with a large shallow fovea, the humeral callus slightly thickened; surface strongly punctate-striate, the interspaces slightly convex on the inner disk, distinctly so towards the lateral margin and towards the apex; interspace next the suture impressed with deep punctures as large as those on the striæ themselves.

Chætocnema submetallescens.

Elongato-ovalis, modice convexa, dorso paullo complanata, picea, æneo-micans, pedibus (femoribus posticis exceptis) antennarumque basi sordide flavis; thorace sat fortiter, concinne punctato; elytris sat fortiter punctato-striatis, interspatiis lævibus, ad latera et ad apicem subcostatis.

Long. ⅝—1 lin.

Hab.—South Australia, Gawler Town.

Head short, broad, swollen between the eyes, rather coarsely punctured; encarpæ and carina obsolete; eyes remote; antennæ more than half the length of the body, three or four lower joints flavous, the rest more or less stained with piceous. Thorax nearly three times as broad as long; sides parallel, moderately rounded, the anterior angles curved slightly outwards, acute; above transversely convex, coarsely punctured. Scutellum transverse, trigonate, its apex rounded. Elytra rather broader than the thorax, oblong-ovate, convex, flattened along the disk, strongly punctate-striate; striæ sulcate, interspaces smooth, subcostate on the sides and towards the apex. Hinder tibiæ with the outer apex pectinate.

Chætocnema Erichsoni.

Ovata, convexa, cuprea, nitida; tibiis, tarsis antennisque piceis, his basi fulvis; thorace fortiter punctato; elytris sat fortiter punctato-striatis, interspatiis ad latera et ad

Digitized by Google

apicem subcostatis, minute, subremote—interstitio primo crebrius—punctatis.

Long. 1¼ lin.

Hab.—Tasmania.

Head subrotundate, rather broader than long, not thickened between the eyes; vertex and front finely punctured, subrugulose, impressed here and there with a few deeper punctures; front separated from the interocular spaces by a deep groove; encarpæ and carina obsolete; antennæ not half the length of the body, six lower joints fulvous, the rest piceous. Thorax twice as broad as long; sides rounded and converging from base to apex, the anterior angles thickened, obliquely truncate, the hinder ones nearly rectangular, acute; upper surface strongly punctured. Scutellum semirotundate-ovate. Elytra rather broader than the thorax, oblong, slightly attenuated towards the apex, regularly punctate-striate, the punctures on the short stria next the suture less regularly placed; interspaces finely but not closely punctured, the 1st and to a less degree the 2nd interspaces more closely punctured.

Genus Stenophyma.

Corpus elongatum, angustatum, parallelum, modice convexum. *Caput* exsertum, *oculis* magnis, prominentibus, rotundato-ovatis, intus vix sinuatis; *encarpis* contiguis; *carinâ* lineariformi, paullo elevatâ; *antennis* corpore longioribus, filiformibus, articulo primo curvato, non incrassato; secundo et tertio brevibus, æqualibus, quarto tribus basalibus æquali, cæteris inter se æqualibus, singulis quarto fere æquilongis. *Thorax* subquadratus, longitudine vix latior, lateribus rectis; angulis posticis acutis, anticis incrassatis, extrorsum non productis; dorso complanato, basi transversim sulcato. *Elytra* thorace latiora, parallela, punctato-striata, limbo inflexo vix ante apicem abbreviato. *Pedes* subelongati, *femoribus* posticis modice incrassatis; *tibiis* apice spinâ armatis, posticis dorso ad apicem canaliculatis; *unguiculis* appendiculatis. *Prosternum* coxis æquialtum; *acetabulis* anticis apertis.

Stenophyma elegans.

Elongata, angustata, fulva, nitida, antennis (basi ex-

Digitized by Google

ceptâ) nigro-fuscis; oculis nigris, elytris piceo-tinctis, regulariter punctato-striatis.

Long. $1\frac{5}{6}$ lin.

Hab.—Brazil.

Head strongly exserted, smooth, impunctate; eyes very large, prominent. Thorax scarcely broader than long; sides straight, very slightly diverging from base to apex; anterior angles nearly rectangular, their apices obtuse; basal margin truncate, oblique on either side close to the lateral angle; the latter distinct, its apex acute; above transversely convex, smooth and shining, transversely impressed just in front of the basal margin with a deep groove, which terminates abruptly on either side close to the lateral border. Elytra broader than the thorax, narrowly oblong, slightly attenuated towards the apex; above moderately convex, flattened along the suture, strongly punctate-striate; interspaces plane, impunctate; surface obscure fulvous, stained at the base, on the outer margin (its apex excepted), and on the inner disk behind the middle, with piceous.

Genus Longitarsus, Latr.

Longitarsus amazonus.

Elongato-ovatus, convexus, pallide piceus, nitidus; elytris, pedibus antennisque piceo-fulvis, harum articulis intermediis piceis; elytris distincte sed tenuiter punctulatis.

Long. $\frac{3}{4}$—1 lin.

Hab.—Pará.

Head elongate-trigonate; vertex impunctate, seen under a lens faintly striolate; encarpæ oblong-ovate, oblique, contiguous; carina linear; antennæ nearly equal to the body in length, filiform, 5th to the 8th joints piceous, the rest pale brunneous. Thorax about one-third broader at the base than long; sides slightly rounded, anterior angles very obliquely truncate; above convex, impunctate. Elytra ovate, broader than the thorax, finely but distinctly punctulate.

Longitarsus scutellatus.

Ovatus, convexus, flavus, nitidus; labro, scutello, femorum posticorum apice antennisque (his basi exceptis) obscure piceis; vertice, pectore, femoribus posticis basi

Digitized by Google

tarsisque fulvo-piceis; thorace lævi; elytris sat crebre fusco-punctatis.

Long. 1½ lin.

Hab.—Australia; Rockhampton.

Vertex smooth, impunctate; encarpæ obliquely transverse, their apices nearly contiguous; carina elongate, slightly elevated; antennæ two-thirds the length of the body; eyes black, slightly sinuate. Thorax scarcely twice as broad as long; sides straight, scarcely converging from base to apex; anterior angle broadly and obliquely truncate, its outer edge produced laterally into a short acute tooth; above transversely convex, smooth and shining, when viewed under a deep lens minutely punctured. Scutellum trigonate, its apex obtuse. Elytra rather broader than the thorax, oblong-ovate, convex, subnitidous, closely covered with small, punctiform, fuscous spots, in the centre of each of which is a minute impression, only visible under a strong lens.

Genus Aphthona, Chevr.

Aphthona Wallacei.

Oblongo-ovata, convexa, subtus nigra, nitida, supra viridi-metallica, minus nitida, pedibus antennisque flavis, his extrorsum femoribusque posticis nigro-piceis.

Long. 1 lin.

Hab.—Flores; collected by Mr. Wallace.

Head trigonate; clypeus and labrum nigro-piceous; jaws piceous; vertex finely granulose; encarpæ transverse, well defined, contiguous; carina linear; antennæ nearly equal to the body in length, six lower joints flavous, the rest pitchy black. Thorax scarcely one half broader than long; sides moderately rounded, the hinder angles produced, acute, the anterior very obliquely truncate; above convex, impressed on the middle of the disk with a shallow, ill-defined, transverse groove, from the hinder border of which a perpendicular, faintly impressed line extends backwards to the hinder margin; surface minutely granulose. Elytra oblong, broader than the thorax, minutely granulose.

Genus Phyllotreta, Foudr.

Phyllotreta orientalis.

Elongato-ovata, convexa, nigra, nitida; thorace crebre punctato, rufo-piceo, pedibus antennisque fulvis, his ex-

Digitized by Google

trorsum, femoribus posticis, capite elytrisque nigro-piceis; elytris oblongis, sat crebre punctatis, utrisque vittâ latâ, à paullo infra basin fere ad apicem extensâ, flavâ ornatis.

Var. A. Elytrorum vittâ medio interruptâ.

Long. 1 lin.

Hab.—Kurdistan.

Vertex deeply punctured; face between the eyes with a transverse rufo-piceous patch; encarpæ subovate, oblique, contiguous; carina elevated, narrow, linear; antennæ more than half the length of the body, filiform, not distinctly thickened towards the apex; five or six lower joints fulvous, the rest nigro-piceous. Thorax rather more than half as broad again as long; sides straight and parallel, rounded and converging from the middle to the apex, anterior angles thickened, obtuse; upper surface closely punctured, the interspaces between the punctures very finely granulose. Elytra broader than the thorax, oblong, their apices obtuse, not entirely covering the apex of the abdomen, the sutural angles rounded; surface closely punctured, the interspaces shining, impunctate; each elytron with a flavous vitta, covering nearly the whole surface, but placed closer to the lateral margin than to the suture. Apex of pygidium acute.

Phyllotreta Cumingii.

Elongata, convexa, nigra, nitida, elytris flavis, anguste nigro-limbatis, tibiis posterioribus basi tarsisque piceis.

Long. 1 lin.

Hab.—Manilla.

Head trigonate, moderately exserted; vertex distinctly but not closely punctured; face raised between the insertion of the antennæ; encarpæ large, trigonate, contiguous; carina linear, anteriorly bifurcate; antennæ rather more than half the length of the body, slightly thickened towards the apex, three lower joints obscure piceous, the rest black; second, third and fourth nearly equal in length. Thorax nearly twice as broad as long; sides slightly converging from base to apex, slightly rounded, anterior angles broadly and obliquely truncate, the hinder ones obtuse; upper surface transversely convex, coarsely but not very closely punctured. Scutellum semiovate. Elytra broader than the thorax, oblong-ovate, convex, coarsely punctured.

Digitized by Google

Genus Sphæroderma, Stephens.

Sphæroderma ornata.

Ovato-rotundata, convexa, picea, nitida, femoribus, capite thoraceque piceo-fulvis, hoc lævi, basi infuscato; oculis antennisque (his basi fulvâ articuloque ultimo albido exceptis) nigris; elytris tenuissime punctatis, utrisque maculis duabus, unâ basali transversâ, alterâ apicali ovatâ, flavis ornatis.

Long. 2 lin.

Hab.—Cambodia.

Vertex smooth, impunctate; encarpæ well defined, contiguous, subrotundate; carina obsolete; antennæ two-thirds the length of the body, four lower joints obscure fulvous, the rest black. Thorax nearly three times as broad as long: sides rounded, scarcely converging at the apex, the anterior angle broadly obtuse, thickened, hinder angle nearly rectangular; basal margin oblique and faintly sinuate on either side the middle, the latter obtusely rounded. Scutellum trigonate. Elytra broadly ovate, convex, very finely punctured; each with two large fulvous patches, the first transverse, basal, occupying the upper fourth of the elytron, but not touching either the base itself or the external or lateral margins, the other oblong-ovate, perpendicular, apical, but separated from the apical margin by a narrow piceous line.

Sphæroderma apicipennis.

Rotundato-ovata, valde convexa, picea, nitida, capite thoraceque obscure rufis, labro antennisque nigris, his basi rufo-fulvis; elytris substriatim punctatis, nigris, apice rufis.

Long. 1¼ lin.

Hab.—Borneo.

Head short, trigonate, vertex smooth, impunctate; encarpæ subquadrangular, slightly oblique, their apices contiguous; carina slightly raised, its apex acute, extending upwards between the encarpæ nearly to their whole length; antennæ two-thirds the length of the body, robust, slightly but distinctly thickened towards the apex, five lower joints pale rufo-testaceous, the rest black; eyes large, rotundate-ovate. Thorax nearly three times as broad as long at the base, basal margin oblique and bisinuate on either side, the medial lobe slightly produced, obtusely

Digitized by Google

rounded; sides margined, obliquely converging and slightly rounded from base to apex, the apical angles slightly thickened, broadly rounded; above convex, finely but not closely punctured. Scutellum trigonate, as broad as long. Elytra much broader at the base than the thorax, the shoulders broadly rounded; sides rounded and converging from before the middle to the apex; above convex, surface more strongly punctured than the thorax, the puncturing on the inner disk indistinctly arranged in longitudinal striæ, the striæ more regular on the outer disk; shining black, the extreme apex rufous.

Genus Argopus, Fischer.

Argopus Fortunei.

Rotundata, valde convexa, fulva, nitida, pectore tarsisque piceo-tinctis; antennis, basi exceptâ, nigris; thorace tenuiter sed distincte punctato; elytris subseriatim punctatis, utrisque plagâ magnâ discoidali flavâ ornatis.

Long. 2¼ lin.

Hab.—Northern China.

Head short, trigonate; encarpæ transverse, oblong-quadrate, contiguous at their apices; carina narrowly oblong, raised, its apex acute; clypeus rugose, its apex slightly but distinctly emarginate; antennæ three-fourths the length of the body, two lower joints fulvous, the rest black; second and third joints short, equal. Thorax rather more than twice as broad as long; sides rounded and converging from base to apex; anterior angle thickened, broadly and obtusely truncate; basal margin oblique and slightly bisinuate on either side; upper surface distinctly but not closely punctured. Scutellum narrowly trigonate. Elytra much more strongly punctured than the thorax, the punctures arranged in irregular longitudinal striæ, interspaces minutely punctured; each elytron with a large flavous patch covering the whole of the disk, leaving a broad fulvous limb.

Genus Stegnaspea.

Corpus ovatum, valde convexum. *Caput* in thoracem insertum, *facie* perpendiculari; *antennis* 11-articulatis; *carinâ* et *encarpis* distinctis. *Thorax* transversim

Digitized by Google

convexum, antice subcylindricum. *Scutellum* nullum. *Elytra* punctato-striata. *Pedes* modice robusti; *femoribus* posticis validis; *tibiis* quatuor anticis apice muticis; posticis dorso canaliculatis, apice spinâ validâ armatis; *tarsorum* posticorum articulo basali ad tibiæ apicem inserto; *unguiculis* appendiculatis. *Prosternum* oblongum, coxis anticis æquialtum; *acetabulis* anticis apertis. *Mesosternum* occultum. *Metasternum* breve, apice ad prosternum producto.

The absence of a scutellum will separate *Stegnaspea* from all known genera of *Halticinæ;* in other characters it closely agrees with *Apteropoda* and allied forms.

Stegnaspea Trimeni.

Ovata, antice et postice attenuata, convexa, piceo-cuprea, nitida, subtus picea, pedibus (femoribus posticis exceptis) antennisque piceo-fulvis, his apice infuscatis; thorace tenuiter, subcrebre punctato; elytris punctato-striatis, interspatiis remote, tenuissime punctatis.

Long. $\frac{5}{6}$ lin.

Hab.—Cape of Good Hope.

Head trigonate; encarpæ linear, obliquely transverse, contiguous; carina narrow, elongate; antennæ about half the length of the body, obscure fulvous, five outer joints stained with fuscous; second, third and fourth equal in length. Thorax more than twice as broad as long; sides rounded and converging from base to apex, nearly parallel at the extreme base, anterior angles thickened, obtuse, hinder ones acute; basal margin sinuate on either side close to the outer edge, its medial portion transversely truncate; above convex, faintly granulose-reticulate, distinctly but finely punctured, the punctures oblong. Scutellum obsolete. Elytra broadly ovate, attenuated towards the apex; above convex, regularly punctate-striate; interspaces plane, remotely and very finely punctured. Breast and basal segment of abdomen strongly punctured.

Genus Dibolia, Latr.

Dibolia Duboulayi.

Anguste oblongo-ovata, convexa, supra cuprea, nitida, antennis fulvis, apice nigris; subtus fulva, femoribus pos-

Digitized by Google

ticis apice nigro-piceis; thorace transversim strigoso; elytris crebre tenuiter punctatis, pone medium sulcis longitudinalibus nonnullis obsoletis impressis; interstitiis hic illic leviter rugoso-reticulatis.

Long. $1\frac{3}{4}$ lin.

Hab.—Western Australia, Nichol's Bay.

Eyes large, subreniform, their apices nearly contiguous; encarpæ small, well defined, subrotundate-ovate, contiguous; carina obsolete; antennæ nearly half the length of the body, three outer joints black, the rest fulvous. Thorax more than three times as broad at the base as long; basal margin faintly bisinuate on either side; lateral margin converging and slightly rounded from base to apex, the hinder angles produced backwards, acute, the anterior obtuse; upper surface transversely convex, rather closely covered with short transverse impressed strigæ, separated on the medial line by a row of perpendicular strigæ, which obliquely diverge on either side and gradually merge into the transverse grooves; surface close to the lateral border finely punctured. Scutellum smooth, trigonate. Elytra broader than the thorax, oblong, convex, impressed on the hinder disk with a few faint but broad longitudinal strigæ; surface closely punctured, interspaces here and there finely rugose-reticulate.

Genus Psylliodes, Latr.

Psylliodes Chapuisii.

Elongato-ovata, postice attenuata, convexa, nitida, supra metallico-cærulea, subtus picea; pedibus obscure fulvis, sæpe piceo-tinctis; antennis pallide fulvis, extrorsum nigris; thorace sat fortiter punctato; elytris fortiter punctato-striatis, interspatiis leviter convexiusculis, ad latera convexis.

Long. $1\frac{3}{4}$—2 lin.

Hab.—Tringanee.

Vertex and front thickened, the former nearly smooth, impunctate, the latter impressed immediately above its bilobate lower margin with a large deep fovea; lower part of face obscure piceous, with a faint metallic reflexion; encarpæ obsolete; carinæ obcuneate; antennæ half the length of the body, five lower joints fulvous, the rest black; second joint slender, rather larger than the basal one.

Digitized by Google

Thorax nearly twice as broad at the base as long; sides straight, converging from base to apex; anterior angle broadly and obliquely truncate, the outer angle of the truncation produced laterally into a short acute tooth; basal margin oblique and slightly sinuate on either side, the medial portion obtusely rounded; upper surface transversely convex, coarsely and deeply, but not very closely punctured. Elytra oblong, attenuated towards the apex, broader than the thorax, strongly punctate-striate, the striæ slightly sulcate; interspaces remotely impressed with fine punctures. Apex of outer border of hinder tibia denticulate, the denticulations very short, irregular.

Digitized by Google

XI. *Notes upon a Strepsipterous insect parasitic on an exotic species of* Homoptera. By J. O. Westwood, M.A., F.L.S., Pres. Ent. Soc., &c.

[Read 4th April, 1877.]

In the "Proceedings" of our Society on the 6th of May, 1867 (Ser. III. vol. v. p. lxxxviii), I recorded the fact that I had observed what I regarded as the head of a Strepsipterous insect protruding from the body of a Homopterous insect, captured by Mr. Wallace; and in the admirable memoir of Sir Sidney S. Saunders, on the *Stylopidæ*, in our "Transactions," 1872, p. 48, the still undescribed parasite is shortly alluded to as forming a separate 'Division B' in the group, termed *Homopterobiæ*. After a second interval of five years, I now beg leave to offer to the Society a short description and figures of this parasite, so far as can be shown by an undissected specimen, the insect itself on which it is parasitic (*Epora subtilis*, Wlk.,* from Sarawak, Borneo) being, I believe, still known only in our collections by the two specimens (male and female) described by Mr. Walker, and which, being in a dried condition, cannot be subjected to a satisfactory internal examination as to the size and extent occupied by the body of the parasite, the head only of which is exserted in the specimen of the female *Epora*.

It is curious to speculate on the modus vivendi of a parasite, like a *Stylops*, in the body of a constantly active Homopterous insect, all the other known species being parasites upon Hymenopterous insects having a quiescent pupa.

A comparison of the figures of the exserted head of this parasite with those published by Von Siebold, Beitr. z. Naturg. Wirb. Thiere, tab. iii. figs. 65, 66, of the head of the pupa of *Xenos sphecidarum;* and by myself in Trans. Ent. Soc. vol. i. N. S., pl. 8, figs. 2*a*—2*i*, of the pupa of *Hylechthrus Rubi*, and vol. ii. N. S., plates 15 and 16, with details of the head of the pupa of *Xenos Heydenii*, especially figs. 11, 12, 13 and 14, must, I

* Walker, in Proc. Linn. Soc. (Zool.) vol. i. p. 145, pl. 7, fig. 3, 20th Jan. 1857.

Digitized by Google

think, be sufficient to carry a conviction that, although there are some differences noticeable between the general structure of the heads of the pupa of this new parasite and of the older known species, we have here a true Strepsipterous parasite, but probably one forming the type of a distinct genus, as might, in fact, be reasonably inferred; and that we cannot regard this new parasite as the pupa of a Dipterous insect, which is, indeed, the only other group to which it might be referred, the hard corneous texture of the head preventing us from referring it to the immature state of any of the parasitic *Hymenoptera*.

I am inclined to suppose, with reference to the position of the parasitic insect between the dorsal segments of the abdomen of the *Epora*, that the present lower surface of the parasite applied to the dorsum of the abdominal segments of the *Epora* is in fact the ventral surface of the parasite, and that (supposing the latter to produce a winged male) the parasitic imago would, on the scaling off of the cephalotheca, creep out belly downwards upon the terminal portion of abdomen of the *Epora*. This supposition gives, of course, a clue to the true signification of the different parts of the anterior portion of the head-case, which I have endeavoured carefully to delineate in figures 4, 5 and 6, as seen in different positions. These parts are in nowise detached from each other, and are simply indicated by depressions, which give a different idea of their structure when seen in different positions with the light falling differently on them. The eye-covers appear at the sides of the head, of large size and somewhat lunate form; between them are two somewhat rounded spaces, partially covered with minute granules, between which is a transverse impression which may indicate the suture between the upper and lower lips; there are also two small transverse pieces, which, I suppose, represent the mandibles, followed by two small swollen spaces, which may indicate the maxillæ. A precise idea of the real structure of these parts can only be obtained by the actual dissection and examination of more specimens, enabling us to investigate the internal structure of the head-case, as was done by Sir S. Saunders and myself in some of the other species represented in the figures in our "Transactions" above referred to.

Although unable to give a scientific diagnosis of this new parasite it may be useful to suggest a name for it, which, in reference to its habits, may be called *Colacina insidiator*.

Digitized by Google

EXPLANATION OF THE FIGURES.

PLATE IV. (Division A.)

Fig. 1. *Epora subtilis*, magnified.

Fig. 2. Dorsal view of the extremity of the abdomen of the same, showing the parasite in situ.

Fig. 3. Lateral view of the same.

Fig. 4. Head of the parasite, seen from the extremity of the abdomen of the *Epora*.

Fig. 5. Head of the parasite, seen from below and behind.

Fig. 6. Head of the parasite, seen more obliquely from above.

Digitized by Google

Digitized by Google

XII. *Notes on the genus* Prosopistoma *of Latreille.* By J. O. Westwood, M.A., F.L.S., Pres. Ent. Soc., &c.

[Read 4th April, 1877.]

Geoffroy, the historian of the insects of the environs of Paris (v. 2, 17, p. 660, pl. 21, fig. 3), first made us acquainted with a small aquatic insect, under the name of "Le Binocle à queue en plumet," which he placed amongst the Apterous genera, and which subsequently received the names of *Binoculus pennigerus*, Latreille, and *Binocle pisciforme*, Dumeril. The insect must evidently be of great rarity, as no Entomologist appears, until recently, to have met with it except its original describer, and its minute organization was not sufficiently described to allow of all its relations being discovered. In the same genus *Binocle*, Geoffroy introduced also the *Apus caneriformis* and the *Argulus foliaceus*.

In 1833 Latreille, however, recalled attention to this almost unknown animal in a memoir which he published in the "Nouvelles Annales du Muséum d'Histoire Naturelle," t. ii. p. 23, entitled "Description d'un nouveau genre de Crustacés," established on an insect which he had found in a box of Madagascar *Coleoptera*, having much the appearance of a *Gyrinus*, and which he did not hesitate to regard as congeneric with Geoffroy's *Binoculus*. The Madagascar specimens were unfortunately in a more or less mutilated condition; and after a comparison of their structure (with such details as had been given by Geoffroy), and that of such genera as *Apus*, *Limulus*, &c., Latreille came to the conclusion that the insects in question could not be arranged with any known Entomostracous or Branchiopodous group, and that, "de tous les Entomostracés ou Branchiopodes, la coupe qui doit les comprendre est, par la composition de la tête, offrant deux antennes, deux yeux à réseau, quatre appendices maxillaires, représentant les mandibules et les mâchoires et une lame mentonnière, ainsi que par le nombre et la forme des pattes, la plus rapprochée des insectes proprement dits." Although the Madagascar specimens exhibited no terminal

Digitized by Google

filaments, Latreille added in his characters of the genus (to which he gave the name of *Prosopistoma*): "Abdomen en forme de petite queue, composé de quatre segments, dont le dernier applati, presque semi-circulaire, portant des *filets barbus branchiaux et rétractiles*," on the authority of Geoffroy's original description, and which, his young friend Audouin had affirmed, existed in the Madagascar insect, "retirés" within the terminal segment of the body. "Il est probable," adds Latreille, "que ces organes servent à la natation et à la respiration et font l'office des branchies; car Geoffroy a observé que l'espèce, par lui décrite, agite précipitamment la queue: ces Crustacés n'ont d'ailleurs aucun autre appendice que l'on puisse regarder comme propre à cette dernière fonction."

Latreille terminates his observations on his new genus with the remark, "Ce genre semble devoir former à lui seul une famille particulière, terminant la division des Crustacés dentés ou munis de mâchoires. Cependant, jusqu'à ce que de nouvelles recherches nous aient parfaitement dévoilé l'organisation buccale, et que nous soyons assurés qu'il n'existe point de siphon, nous suspendrons notre jugement." Lastly, Latreille gave the specific name of *Pr. variegatum* to the Madagascar insect, and that of *Pr. punctifrons* to Geoffroy's French species.

In 1872, appeared in the Annales des Sciences Naturelles, 5 Ser., Zool., t. xvi. Art. 7, a memoir by Messrs. N. & E. Joly, entitled, "Etudes sur le prétendu Crustacé, au sujet duquel Latreille a crée le genre Prosopistoma, et qui n'est autre chose qu'un véritable insecte hexapode;" "un véritable insecte, encore incomplètement développé, encore dans cet état que les naturalistes Anglais designent sous la denomination heureuse, mais un peu élastique, de 'an immature condition,' une larve aquatique d'Ephémérine."

This unexpected conclusion was arrived at by these authors in consequence of one of them having rediscovered it in September, 1868, in the basin of the Garonne, near the Island of Grands Ramiers, and thus being able to make a complete examination of the more important internal organs of the creature than could be obtained from dried individuals or from the incomplete description of Geoffroy.

The most important of the structures observed by these authors is the discovery of a tracheal system of respiration, announced as follows: "S'il pouvait rester encore quelques

Digitized by Google

doutes sur la vraie nature du prétendu Crustacé de Geoffroy, de Dumeril, et de Latreille, tous ces doutes seraient dissipés à la fois par la seule présence des trachées qu'on observe chez lui. Or, des dissections minutieuses et que nous croyons exemptes d'erreur, nous ont appris qu'il existe sous la carapace, à la partie latérale des cinq premiers segments abdominaux de notre animal, cinq paires de fausses branchies très-analogues à celles de plusieurs larves d'Ephémérines, et notamment du genre Cænis." An elaborate plate of details accompanies this memoir, from which the figures in Plate V. are copied, and which are here introduced in order to allow comparison with them of the various details observed by myself in examining Latreille's existing types of his Madagascar species, which I had the pleasure to find and obtain, in one of my visits to Paris, in the wreck of his collection of the minute Crustacea and other Linnean apterous insects.

M. E. Joly has published several other papers on the insect of Geoffroy, in the Mémoires de la Société des Sciences Naturelles de Cherbourg, 1871, t. xvi.; also, "Nouvelles recherches tendant à établir que le prétendu Crustacé, décrit par Latreille sous le nom de Prosopistoma, est un véritable insecte de la tribu des Ephémérines," published in the Revue des Sciences Naturelles (of Montpellier), tome iv. Juin, 1875;* also an article "Sur le Prosopistoma," in the Feuille des Jeunes Naturalistes, 1er Mars, 1876, Sixième Année, No. 65; and "Notes sur les caractères d'un larve d'insectes de la famille des Ephémérines" (Rev. Soc. Sav. (2) iii.). This larva, found near Toulouse, possesses respiratory organs protected by two trapezoidal lamellæ, and is doubtingly referred to the genus *Cænis*.

The figures of *Prosopistoma punctifrons* and its details, which M. E. Joly has given in the Annales des Sciences Naturelles (5 Ser. Zool., tom. xvi. pl. 13), disagree in many important particulars from the examination which I have been able to make of a specimen of that species sent by M. Joly himself to Mr. MacLachlan, and which I find

* In this memoir, Messrs. Joly have endeavoured to prove the correctness of their opinion as to the Ephemerideous nature of these creatures, by the discovery of the singular New Zealand Ephemerideous *Oniscigaster Wakefieldi* of MacLachlan (Il. Linn. Soc. xii. p. 145), and the pupa of *Baetisca obesa* of Say, figured and described by Walsh.

Digitized by Google

to agree almost entirely with the Madagascar specimens of Latreille.

The semicircular head in the animal itself exhibits in front of its upper surface a distinct transverse upper lip, and on its under surface a decidedly marked triangular space, the former corresponding in position with the upper lip, and the latter evidently representing an under lip or mentum—of neither of these parts is there any trace in M. Joly's figure.* The antennæ are extremely small and scarcely extend beyond the impressed spaces in which they are inserted. With the exception of the triangular space above noticed the under surface of the head is flat and entire, exhibiting no trace (in all the specimens of both species) of any of the mouth organs or mask spoken of by Latreille and Joly, the latter of whom represents the trophi as, apparently, partially visible through the flat under-covering of the head. The ocelli represented by M. Joly appear to me to be very questionable. Between the antennal impressions are two minute punctures placed transversely, and behind them a small central tubercle. In *P. variegatum* there is a very slender, waved, raised line in front of the eyes, like a pair of tubercles, within which this line is directed nearer to the hind margin of the head, having between it and the margin two small dark dots, which have been regarded as the posterior ocelli by M. Joly. The large entire carapace, convex and longitudinally ridged above and flat beneath, entirely recalls to mind the shell of a tortoise. The sternum is clearly divisible by slight impressions into three parts,† the anterior (prosternum) being more distinct than the others and considerably longer and more distinct than is represented by M. Joly. The mesosternum terminates between the base of the middle legs, and the metasternum seems formed of four pieces, the first terminating transversely between the third pair of legs, whilst the other three divisions form the triangular space extending to a point as far back as the extremity of the posterior femora. Here there is a distinct transverse articulation forming a joint, considerably narrower than the hind part of the carapace, obliquely truncate on each side. This articulation is the part represented in M. Joly's figure 3, as C 5, but which

* Both these structures are, however, indicated in M. Joly's more recent figures.

† None of these divisions are indicated in M. Joly's recent figures.

Digitized by Google

he has misdrawn by making its posterior lateral angles extend outwards. The preceding space on each side of the pointed metasternum is regarded by M. Joly in all his articles as abdominal, and is actually lettered C 1, C 2, C 3, and C 4, as so many abdominal segments, respecting which I can only observe that in both species I have failed to see any trace of articulation except that between C 4 and C 5, as above mentioned. M. Joly further represents, in the middle of the hind margin of his C 5, a small tongue-like piece, which he describes as "les deux valves à travers l'orifice desquelles s'échappe l'eau qui a baigné les fausses branchies." I have seen nothing of these valves. The terminal part of the body in all the specimens before me consists of three segments, the first and second of which are very short, with the lateral posterior angles produced to a point, and the third is large, with the anterior and lateral margins raised with a sharp edge, giving the appearance of a basal division, which M. Joly has enlarged into a distinct segment, making the merely rounded and slightly concave portion of the segment quite distinct from the other part, with its posterior edge scalloped,* and with a circular opening in the centre, which he terms the "ouverture anal." In all my specimens the hinder margin is entire and sharp, and the upper surface without any aperture.

In none of my specimens is there to be seen any trace of the three anal filaments which M. Joly represents as nearly the third of the length of the entire body.

The want of sufficient materials has prevented me from instituting an examination of the structure of the mouth organs or of the respiratory apparatus as figured by M. E. Joly.

He represents the labrum as transverse and ciliated, with the anterior lateral angles rounded off, and the middle of the fore margin slightly produced (his fig. 5); the mandibles (fig. 7) and maxillæ (fig. 8) as elongated, terminating in several sharp teeth (the maxillæ having an extra and stronger bifid tooth), below which are a few strong curved bristles, and the lower lip (fig. 6) as emarginated at the sides, and rounded in front with two small palpi, having

* In his more recent figures, M. Joly has represented the extremity of his 4th abdominal segment as truncate, with three ridges produced by the bases of the three anal filaments.

Digitized by Google

a very short basal and a longer elongate-ovate terminal joint. The antennæ are represented (his fig. 14) as 4-jointed and cylindrical, the joints gradually shortening to the tips.

My object in the preceding observations has been to describe the precise structure of the singular creatures under examination. I by no means wish to disparage, in the slightest degree, the value of the admirable deduction which Messrs. Joly have arrived at as to the insect-nature of *Prosopistoma*, founded on the examination of recent specimens. Further, with the example of my *Branchiotoma Spongillæ* (now ascertained to be the larva of one of the *Hemerobiidæ*) before us, we need scarcely be surprised if *Prosopistoma* should prove to be the larva of an Ephemerideous fly. Its whole character is, however, so anomalous and unlike that of any other Ephemerideous larva, that direct observation alone of its transformations will be required to confirm the opinions of Messrs. Joly.

DESCRIPTION OF THE FIGURES.

PLATE IV. (Division B.)

Fig. 1. *Prosopistoma variegatum*, magnified; seen from above.
Fig. 2. The same, ventral surface.
Fig. 3. One of the six legs of ditto.
Fig. 4. One of the maxillæ terminating in a group of four strong curved bristles, with a single one detached. The long basal piece on the right side of the figure may possibly be extraneous.
Fig. 5. Extremity of the body of *P. punctifrons*. (From M. Joly.)

PLATE V.

(Copied from the figures published by Messrs. Joly.)

Fig. 1. *Prosopistoma punctifrons*, magnified. From "Annales des Sci. Nat. Zool.," Ser. V., Zool., vol. xvi., pl. 13, shewing, *a*, the trophi, *m*, the 'lèvre inférieure' or 'espèce de masque,' and 1, 2, 3, 4, 5, the first five segments of the abdomen.
Fig. 2. Underside of the head.
Fig. 3. The labrum.
Fig. 4. One of the mandibles.
Fig. 5. One of the maxillæ.
Fig. 6. The labium with its palpi.
Fig. 7. One of the antennæ.
Fig. 8. Portion of the tracheo-branchial apparatus.
Fig. 9. The two valves of the posterior margin of the carapace, shewing the minute carmine molecules which escaped with the water used in respiration.
Fig. 10. The corrected figure of the same animal (from the "Feuille des Jeunes Naturalistes," 1st March, 1876); seen from above.
Fig. 11. The same (from ditto); seen from below.
Fig. 12. The terminal segments of the body; seen from above. (From the "Annales des Sci. Nat.")

Digitized by Google

XIII. *On the Adult Larvæ of the* Stylopidæ *and their Puparia.* By Sir Sidney Smith Saunders, C.M.G. With Remarks and Figures, by Professor Westwood, M.A., &c., Pres. Ent. Soc.

[Read 2nd May, 1877.]

The President having called attention to the position of the adult larvæ of *Stylopidæ*, preparatory to their ultimate metamorphoses, as indicated by the head-caps of their puparia, in connexion with the remarkable Homopterous parasite of this family, described in his memoir read at our last meeting, I have brought for inspection two puparia of *Stylops* (from Hampstead), with their head-caps re-attached in situ, and several other head-caps of like origin, some having the anterior segments of the puparia still connected therewith; shewing that, contrary to the position in which the imago *Stylops* emerges, the adult larvæ, like those of *Xenos* and its allies, are accustomed to penetrate between the abdominal segments in a *reversed* position, with the ***ventral region uppermost.***

It is well known that all the *females* of this family occupy the same relative position *inter se*, when protruded from the abdominal segments of the Hymenopterous insects upon which they have subsisted; the *convex* region of the cephalothorax, outwardly exhibited, being regarded by Siebold as the *ventral*, and the *concave* as the *dorsal* region;* whereas in some genera the *males* are accustomed to emerge in the imago-form with their feet directed towards the abdomen of their foster-parents, and in others reversed, as figured by Professor Westwood in our Transactions (Vol. 2, N. S., pl. 16, figs. 1, 2).

But although the true *Stylops*, and others reared within the soft-bodied Mellifera, effect their exit from the puparium in what we may term a natural position, with their feet towards the abdomen of the bee, yet, by a careful examination of these puparia it will be observed that traces of the leg-sockets of the primal larva-form are perceptible

* Wiegmann's "Archiv. für Naturgeschiete," 1843, pp. 149, 150.

Digitized by Google

on the upper or outer region of the thoracical tegument, as in those of the *Xenides* and their allies (loc. cit. pl. 15, fig. 5); the adult larvæ being reversed in all alike. This position the active pseudo-pupa, like that of Sitaris (as described by Fabre in Ann. Sc. Nat., 4e Série, Zool., Tome VII. 1857, p. 341), is enabled to change on first detaching itself from the corneous puparium, when the less constricted segments of the Mellifera, and the consequent rotundity retained by the puparia, offer no obstruction thereto; the true pupæ themselves having subsequently ceased to move, and exhibiting the same position as in the imago-stage.

If the anterior segments of the puparium of a *Stylops* be longitudinally divided from below by a delicate incision, and laid open, the upper or outer unsevered region exhibits on each of the three thoracical segments a pair of transparent circlets, occupying the position of the original larval legs (*f*); the first four somewhat approximated on their narrow segments; the other two more remote and wider apart, near the base of the metathorax, in a direct line with the former. The same occurs in *Hylechthrus*. (Trans. Ent. Soc. Lond., Ser. I., pl. 8, fig. 1 *k*).

On either side of the two anterior pairs of podal circlets aforesaid (*f*1, *f*2), are two polished spaces (*x* and *y*), nearly in alignment therewith; but the first segment following the head being considerably *narrower* on either side, these polished spaces are properly ascribable to the *mesothoracic* and *metathoracic* regions, corresponding in position with the *elytra* and *wings* of the imago.

Immediately beyond these, occupying a lateral position on either side, in proximity to the second and larger pair of polished spaces (*y*), is a well-defined bulging corneous infundibuliform process (*z*), emanating from a speckled circular plate near the anterior margin of the metathorax, and emitting a long and slender tube which extends backwards to the metasternum. These tubes would seem to perform the function of *spiracles* in the adult larval stage; the speckled plate covering the orifice being apparently the *metapnystega* of Kirby and Spence.

On the opposite region between these spiracles the intervening space is destitute of any trace of functional organization.

Hence it follows that in the head-caps (thus reversed in situ) the palpi of the imago *Stylops* are represented by two glossy circular discs (*a*) near the posterior margin on

Digitized by Google

the outer or upper region, each furnished with a minute central dot; in front of which are two projecting auricles (*b*), situated on either side of the labrum (*e*), having an intervening transparent space (the original larval mouth); followed by a longitudinal central elevation terminating in an abrupt notched declivity (the frontal region?) (*d*); all these being encompassed by an oblique facial belt, commencing below the notch and extending backwards on either side to the posterior margin of the head-cap above.

Beyond the notch, and outside this belt, are two other circular glossy discs (*c*), somewhat larger and farther apart than the first-mentioned pair, having in like manner a central dot, apparently indicating the position of the antennæ in the imago, whose eye-shades, more or less studded with faint traces of the detachment of the facets, are conspicuous on either side of the head-cap.

As regards the parasite nurtured by the *Epora*, the *female* of this *Stylopite* would necessarily assume the same position as others when perforating between the abdominal segments; and it would seem reasonable to infer that the adult-larva of the male should in like manner correspond therewith, as witnessed in other instances, the analogies in the head-cap being thus presumably reversed as compared with the imago.

Oxford, 5th June, 1877.

My dear Sir Sidney,—Herewith I return your paper on the larvæ and puparia of the *Stylopidæ*, with a set of drawings which I have made from your preparations, in order to illustrate your observations.

These drawings (Plate VI.) represent—

Fig. 1. The adult male *Stylops* within the puparium, which exhibits the two prominent auricles (*bb*) and the nasus-like front of the head-case (*d*).

Fig. 2. The full-grown larva of the male *Stylops* in situ, with the terminal segments of the *Andrena* within which it has been reared. This figure shews that the very convex portion of the surface of the head of the larva is in contact below with the dorsal portion of the abdominal segment of the *Andrena;* it also shews the projecting auricles (*bb*), the nasal prominence or notched declivity (*d*), and one of each of the two pairs of ocelli-like discs (*a* and *c*); together with three of the six (podal) circlets (*f*1, *f*2, *f*3) upon what is here the dorsal surface of the segments following the head; also two of the oval polished spaces below the aforesaid (*x* and *y*); and one of the lateral spiracles (*z*).

Digitized by Google

Fig. 3. The head-case of the full-grown larva, with part of the succeeding segment seen from above, but looking rather obliquely forwards, shewing the transverse lip (*e*); the two projecting auricles (*b*); two of the circular discs (*a*); and one of the pairs of spaces behind the head (*f* 1).

Fig. 4. Shews the head-case of the larva seen sideways, shewing the more convex surface (*g*), which lies upon the dorsal surface of the abdominal segment of the *Andrena*.

Figs. 5, 6 and 7. Shew the head-case of the larva of the *Stylops* seen in different positions with the auricles and other organs lettered alike throughout the different figures.

Fig. 8. Mandible of *Hylechthrus rubi*.

Fig. 9. Extremity of palpus of ditto, with the terminal part of the last joint folded back.

Fig. 10. Antenna of ditto, with the terminal portion of the first branched joint broken off.

REFERENCE TO LETTERING.

a—*e*	.. .. ..	Head-parts.
f 1, 2, 3	.. .. ..	Podal analogues.
g ..	.. .. ..	Dorsal region.
x and *y*	.. .. ..	Alary analogues.
z ..	.. .. ..	Spiracle.

If we regard the upper series of circlets in the segments behind the head of the larva of *Stylops* seen in fig. 2 (*f* 1, *f* 2, *f* 3), as representing the legs of the imago in a very rudimentary state, and the two polished spaces below (*x* and *y*) as corresponding with the elytra and wings, it will be evident that the immature imago seen in fig. 1, with the legs downwards, must have turned itself half over so as to bring its dorsum opposite to where the leg-rudiments had previously been, since the projecting auricles and other organs of the head retain the same relative position in both figs. 1 and 2.

Thus the larva represented in fig. 2 must have protruded its head through the connecting tegument of the abdominal segments of the *Andrena* with its dorsum downwards; and hence we are further led to consider that the more convex portion of the head of the larva of *Stylops* (fig. 4, *g*) is in reality the dorsal region, and that the male *Stylops* imago would have emerged from the puparium with the legs upwards and back downwards had it not turned within at some intervening period.
I remain, yours very truly,

J. O. WESTWOOD.

POSTSCRIPT.—Figs. 11 and 12 have been added, in order to shew the arrangement of the thoracic segments and their organs as seen in the exuvia (or larval skin) of

Digitized by Google

a male *Stylops*, exhibited in a very excellent preparation quite recently made by Sir Sidney Saunders, which seems clearly to demonstrate that the larva, when it protruded its head (by means of the horny nasal prominence marked *d* in the various figures) was lying with its back downwards and its ventral surface upwards; whereas in fig. 1 we see that the inclosed pupa had reversed this position and had turned its ventral surface in the direction where its dorsum had previously been. This opinion has originated in the idea that the parts distinguished by the letters *f*1, *f*2 and *f*3, in figs. 11 and 12 are subsequently developed into the first, second and third pairs of legs; that *x* is one of a pair of polished oval spaces which apparently represent the position of the future mesothoracic pseudhalteres; that *y* is one of a similar pair of spaces where the wings or metathoracic organs of flight originate; and that *z* is one of a pair of metathoracic spiracles from which extends, within the skin of the exuvia, a slender dark-coloured tube or trachea; and it is to this spiracle and tube that I alluded in my "Introduction to Mod. Class. Insects," ii., p. 296, lines 27—32.

J. O. W.

Digitized by Google

Digitized by Google

XIV. *On* Ceratorrhina quadrimaculata (*Fabr.*), *and descriptions of two new allied species.* By H. W. Bates, F.L.S.

[Read 2nd May, 1877.]

Mr. F. J. Horniman has had the good fortune recently to receive from his correspondents at the Camaroons, on the west coast of Africa, a series of both sexes of that beautiful and little-known Goliathide the *Ceratorrhina quadrimaculata* of Fabricius and Olivier. The male appears never to have been described, and I avail myself of the opportunity afforded by Mr. Horniman to supply the desideratum; adding the descriptions of two allied species from his collection.

1. *Ceratorrhina quadrimaculata*, Fabr. Spec. Ins. I. 56; Oliv. Entom. No. 6, p. 30, pl. 8, f. 73.

♂. Oblongo-quadrata, paulo convexa, læte viridis, capite rufo, elytris fulvescentibus utrinque nigro-bimaculatis; femoribus supra rufis, tarsis piceo-nigris; thorace sparsim punctato, elytris tenuissime punctulatis.

Caput quadratum, supra concavum, clypei angulis acutis, margine antico cornu brevi obtriangulari, vix furcato, armato; occipite dentibus duobus, distantibus, porrectis. Tibiæ anticæ intus vix tuberculatæ.

Long. 16—18 lin.

Both sexes may readily be distinguished from *C. aurata*, which in general form and colour the species much resembles, by the red colour of its head and its black tarsi. The male is further distinguished from the same sex in *C. aurata* by the much greater length and the different armature of the head. The anterior lateral angles, and the marginal horn of the clypeus, are nearly the same in both species; the horn, of course, varying according to the grade of development of the individual, in highly developed examples presenting five obtuse teeth on its upper expanded edge which is rudimentarily furcate. But the occipital horns are highly peculiar, being in the form of stout, acute spines, sub-horizontally porrected, but some-

Digitized by Google

what curved. They are parallel, sometimes short, sometimes of considerable length, and always distant from each other. In all examples, of both sexes, the upper part of the femora is red. The sculpture of the surface does not differ much from that of *C. aurata*, and the black spots of the elytra are always well-defined and unconnected by vittæ.

The female sent by the same correspondent has been compared by Mr. D. G. Rutherford with the type of Fabricius' species, still extant in the Banksian Collection at the British Museum, and found by him to agree perfectly with it.

Three ♂ and two ♀ found at Mapanja, and one ♀ at Manjunga, on Camaroons Mountain.

C. Hornimani, n. sp.

Oblongo-quadrata, paulo convexa, læte viridis, capite rufo, elytris fulvo-viridibus utrinque oblique viridi-vittatis; femoribus supra vix rufo-tinctis.

♂. Caput ut in *C. 4-maculato* quadratum, concavum, antice cornutum, at differt cornubus occipitalibus approximatis.

Long. 16—18 lin.

Closely allied to *C. quadrimaculata*, but differing in all its examples by the spots of the elytra being connected by a dark-green vitta, the suture being also bordered with the same colour. As minor differences in both sexes may be mentioned, the nearly uniform green colour of all the femora, and the bisinuate margin of the thorax at the part where it is contiguous to the scutellum. The most important point of distinction, however, is in the position of the occipital horns, or prongs, of the male; these being close together, or median, instead of wide apart, or lateral.

Two examples from Mapanja, on the Camaroons Mountain, and five from Manjunga.

C. Grandyi, n. sp.

C. quadrimaculatæ affinis, sed minor; læte pomaceo-viridis, capite antennisque rufis (mento viridi), femoribus anticis et intermediis supra et elytris flavo-testaceis, his vittis duabus viridibus, una suturali altera ab callo humerali usque ad callum apicalem oblique ducta.

♂. Caput quadratum, medio profunde excavatum, vertice dentibus duobus parallelis, approximatis; clypeo an-

Digitized by Google

gulis lateralibus acutis, medio cornu suberecto obtriangulari, apice fortiter concavo et unidenticulato. Tibiæ anticæ intus simplices, nec spinosæ.

Long. 14 lin.

♀. Caput rufo-auratum viridi-varium, clypeo medio distincte sinuato.

Long. 13 lin.

Closely allied to *C. quadrimaculata* and *C. Hornimani*. It differs from both in the clearer tawny-yellow colour of the elytra, and from *C. Hornimani* in the darker and more clearly-defined green stripe connecting the humeral with the apical callus. From *C. quadrimaculata*, the ♂ further differs in the central and closely-approximate occipital horns. The thorax is finely chagreened and distinctly punctured; the elytra are also chagreened and punctulated. It is much more nearly allied to *C. Hornimani* than to *C. quadrimaculata*, but sufficiently distinct to be recorded under a separate name.

One pair taken by Lieut. Grandy (of the Livingstone Congo Expedition), at Bembe or San Salvador, in the interior of Angola. Now in the collection of F. J. Horniman, Esq.

Digitized by Google

Digitized by Google

XV. *On the Food of Gaily-coloured Caterpillars.* By J. W. Slater.

[Read 6th June, 1877.]

Thanks to the observations of modern entomologists—among whom may be especially mentioned Messrs. Wallace, Bates, Belt, Jenner Weir, Butler, &c.—it is now very generally admitted that insects whose striking coloration is unfavourable to concealment may be expected to possess, in compensation, some especial means of protection, whether offensive weapons, hard integuments, a nauseous taste or a disagreeable odour. In some instances, however, we see certain species avoided by what we might consider to be their natural enemies, but we remain unable to detect the reason. In other cases, whilst recognizing that insects are protected by an unpleasant flavour or scent, we can throw very little light upon its origin. Thus, after taking into consideration the facts recorded by Mr. Weir and Mr. Butler in their interesting papers to be found in the "Transactions" of the Society for 1869, it would be a very superfluous task to give further confirmation of the immunity from the attacks of birds and other insect-devourers which *Abraxas grossulariata* enjoys both when mature and when in the larval condition. Almost as useless would it be to doubt that this immunity must depend upon an evil taste or odour, or a combination of the two. But I am not aware that any clue has yet been found to the origin of this repulsive property. It seems to me that strikingly-coloured insects, not otherwise specially protected, will be found to feed upon poisonous plants, or upon such as, though not poisonous, possess unpleasant, or at least very powerful, odours or flavours. From such a diet I conceive that the insects in question may receive properties positively injurious, or at least disgusting, to their enemies, and that a brilliant colouring may therefore here serve as a danger signal, like the quarantine flag, warning all comers to keep their distance.*

* See also Wallace, in Proc. Ent. Soc., March, 1867.

Digitized by Google

Some striking instances of this association of a poisonous diet with a conspicuous coloration may be found among the larvæ of the hawk-moths. Of these there are three species—*Deilephila Galii*, *Nicea* and *Euphorbiæ*—which feed upon different species of *Euphorbia*, all containing an irritant poison. The caterpillars are very conspicuous in their coloration. Thus *D. Nicea*, when young, is of a light green, with rows of black spots, those of the two central series having each a yellow pupil. After the fourth moulting the green turns to a vinous-red and finally to a reddish-grey, whilst the yellow spots become orange. Few caterpillars are better adapted to catch the eye of every passing bird.

D. Euphorbiæ, the spotted elephant, is equally striking. Its ground colour is a glossy black with a number of small yellow dots arranged in belts. Down the back runs a narrow bright red line, on each side of which are two rows of large spots, yellow, white or reddish. The head, feet, and the base of the tail-horn are of a bright red.

D. Galii, the madder-hawk, has a bronze-green ground colour, with a yellow dorsal line, large round yellow spots bordered with black along its sides, and a red caudal horn. In short, it would be difficult to point out three equally conspicuous caterpillars in the European fauna. It may be said that the caterpillar of the madder-hawk feeds also, as its name implies, upon madder and bed-straw, which are certainly not poisonous. They contain, however, a nauseously bitter principle; and further, this caterpillar is, of the three just mentioned, the least striking in its appearance. It must further be remembered that these caterpillars grow to the length of nearly three inches, and to a proportionate thickness, and that the Euphorbiæ grow not in woods or thickets, but in open sandy plains and at the side of field-paths where the vegetation is very scanty. Their stems are slender and their leaves narrow, so that for caterpillars of such size and colour there is absolutely no concealment. I once lived for two seasons at a locality in Upper Silesia where *D. Euphorbiæ* was exceedingly common, and during the months of July and August I could often distinguish the caterpillars at a distance of six or eight paces, and how they could escape the observation of birds I cannot imagine. Hence I think it may be safely inferred that these caterpillars are specially protected, either by an offensive odour, a bad

Digitized by Google

taste, or by unwholesomeness if eaten, and that their remarkable coloration instead of being an attraction to birds serves as a warning. The late Mr. E. Newman, indeed, remarks that, in the neighbourhood of Barnstaple, the only English locality where this caterpillar is found in numbers, it is devoured by sea-gulls and terns. This fact, however, does not disprove the nauseousness of the caterpillar, nor its protection against ordinary insectivorous birds. Sea-gulls are by no means nice in their tastes.

It may not be out of place to remark that a vast field of research lies open in ascertaining the connection between the food of an animal and the odour, flavour and physiological action of its flesh, if eaten. Insects especially, from the colouring matters, the powerful scents, and the poisons which they elaborate, present a multitude of unsolved questions. Investigations of this nature belong, indeed, rather to chemistry than to entomology, but they would nevertheless throw much light upon a variety of entomological topics.

But the larvæ of the three hawk-moths just mentioned are not singular in combining a conspicuous coloration with a diet which, from a human point of view, must be pronounced poisonous. The king of European hawk-moths, *Chærocampa Nerii*, is another instance. The caterpillar is green, spotted with white, the two first segments being of a lemon-yellow, whilst the third bears two white spots surrounded with bright blue, and beyond this with black. At the fifth segment begins on each side a white band leading to the tail-horn, often bordered with blue in its hinder portion, and accompanied both above and below with an irregular number of white spots. The oleander, its food-plant, notwithstanding the beauty of its flowers and its exquisite perfume, is known to be poisonous.

Again, the caterpillar of the privet-hawk, too well known to need description, must be admitted to be conspicuous, and its food-plants, the privet and the laurel, are both poisonous.

In contrast with the caterpillars above mentioned we may take those of the lime- poplar- and oak-hawks, the eyed-hawk, the large and small elephants, and the unicorn-hawk. All these feed upon plants not poisonous, and are accordingly less conspicuously coloured. On the other

Digitized by Google

hand, the caterpillar of the death's-head is strikingly coloured, and of its food-plant, the potato, we may surely say that all parts above the soil are poisonous.

It will be at once objected that in the food of the magpie- or currant-moth, conspicuous and protected as its larva is well known to be, there is nothing poisonous. This is perfectly true, but in the currant-bush there are, so to speak, the raw materials for a most offensive odour. If the shoots of a currant-bush are dried in a slow oven, the smell produced strongly resembles that of the urine of cats. It may not be generally known that the juices of the magpie-caterpillar are decidedly irritating to the skin. I have been assured by Lancashire gooseberry fanciers, who often pick the caterpillars off their choice bushes by hand, that after this operation their fingers were often red and painful.

I have not been able to ascertain anything definite concerning the caterpillars of the Heliconias, nor yet concerning the plants upon which they feed. Both Mr. Bates and Mr. Belt notice the unpleasant and enduring smell of the insect when mature. Mr. Bates describes the caterpillar of a Sphinx which he found on the leaves of a tree on the open llanos of South America. "It was about four inches in length, transversely banded with black and yellow, and with its head, legs and tail of a bright red. It caught the eye at the distance of many yards." I am indebted to him for the information that to the best of his remembrance the tree abounds in prussic acid.

Mention was made, in an interesting paper lately read before this Society, of the recent spread of *Danais Archippus*. The poisonous character of the Asclepiads, upon which this insect and its allies feed, is well known, and the caterpillars are decidedly conspicuous. That of *D. Archippus* is described as whitish with yellow lines and black transverse bands. The caterpillar of *Danais Chrysippus* is of a purplish-white, ringed with black and yellow.

The caterpillar of *Thais Polyxena* is yellow, spotted with black, and with five rows of reddish-orange spines. It feeds upon some species of *Aristolochia*, a tribe of plants known for its violently purgative and vermifuge properties.

It would be important to ascertain by direct experiment in how far caterpillars feeding upon poisonous plants are

Digitized by Google

rejected by birds, spiders, lizards, &c. The connection which I have provisionally ventured to assume between conspicuous coloration and a poisonous or offensive food-plant can scarcely be either established or refuted till we possess a more complete knowledge of the habits of many species of Lepidoptera, especially exotic.

To what extent are Heteropterous insects, many of which are very poisonous and very strikingly coloured, to be considered protected, and, as far as the phytophagous species are concerned, what relation is there between their poison and the plant on which they feed?

Digitized by Google

Digitized by Google

XVI. *Descriptions of new genera and species of* Cryptocephalidæ. By Joseph S. Baly, F.L.S.

[Read 1st August, 1877.]

List of Species.

Cœnobius lividipennis	Camaroons.
„ ruficollis	Port Natal.
„ discoidalis	„
„ fulvipes	India.
„ chinensis	China.
Monachus angulicollis	Columbia.
„ obscuricollis	Pará.
Melixanthus Adamsi	China.
„ placidus	„
Cryptocephalus Jansoni	„
„ notatipennis	Pará.
„ gratus	Parana.
„ histrionicus	Brazil.
„ amazonus	Pará.
Stegnocephala discoidalis	Amazons.
Paracephala (n. g.) pectoralis	Australia.
Euphyma (n. g.)	
Idiocephala Chapuisii	Australia.
„ bella	„
Rhombosternus pretiosus	„
Paracadmus (n. g.) lacifugus	„
Acolastus Simonsi	Lake Nyassa.
Metallactus eximius	Amazons.
Pachybrachys contortus	„

Genus Cœnobius, Suffr.

Cœnobius lividipennis.

Ovatus, valde convexus, fulvus, nitidus, elytris piceis, metallico-violaceo vix micantibus, fortiter punctato-striatis; interspatiis convexiusculis, ad marginem lateralem convexis.

Long. $1\frac{1}{6}$ lin.

Hab.—Guinea, Camaroons.

Eyes large, contiguous, antennæ rather longer than the head and thorax, obscure fulvous, six outer joints slightly thickened; apex of jaws black. Thorax twice as broad at the base as long; sides rounded and converging at the base, thence obliquely converging to the apex, hinder angles acute; basal margin oblique and slightly bisinuate

Digitized by Google

on either side, the medial lobe acute; above subconic, cylindrical at the apex, the entire outer limb bordered with a single row of deep punctures; surface sparingly impressed here and there with coarse punctures, finer and more remote in the middle of the disk; on either side near the lateral margin is an ill-defined transverse groove; basal margin very narrowly edged with black. Scutellum narrowly ovate, attenuated at the base, rufo-fulvous, edged with black. Elytra oblong, not broader than the thorax; convex, strongly punctate-striate, striæ moderately sulcate, the seventh stria from the suture commencing below the humeral callus, oblique and joining the sixth stria just below its middle; fifth and eighth striæ abbreviated some distance below the middle of the elytron; interspaces smooth and shining, moderately convex, more strongly so on the outer border.

Cœnobius ruficollis.

Ovatus, valde convexus, niger, nitidus, thorace impunctato, facie inferiori, antennarum basi pedibusqu rufo-fulvis; elytris regulariter punctato-striatis, interspatiis convexis.

Long. $\frac{4}{6}$ lin.

Hab.—Port Natal.

Head rather coarsely punctured; vertex black; eyes large, nearly contiguous at the apices, being only separated by a very narrow line; antennæ two-thirds the length of the body, six outer joints slightly thickened; six lower ones pale rufous, the rest black. Thorax nearly twice as broad at the base as long; sides rounded and converging from base to apex; basal lobe acute; above convex, cylindrical at the apex, the apical margin bordered by a deep transverse sulcation; surface shining, impunctate, the basal margin narrowly edged with piceous. Scutellum narrowly lanceolate-ovate. Elytra oblong, convex, not thickened behind the scutellum, strongly and regularly punctate-striate; interspaces shining, impunctate, convex, those over the outer margin subcostate. Prosternum slightly broader than long, its apex produced, obliquely deflexed, its hinder margin slightly concave-emarginate. Metasternum and abdomen black.

Cœnobius discoidalis.

Breviter ovatus, valde convexus, niger, nitidus, antennis basi pedibusque obscure fulvis, his piceo-tinctis, femoribus

Digitized by Google

posticis quatuor totis piceis; thorace sub crebre punctato; elytris crebre punctato-striatis, fulvis, margine exteriori suturâque nigro-piceis, plagâ communi trigonatâ magnâ, a basi ad paullo infra medium productâ, nigrâ instructis.

Long. 1 lin.

Hab.—Port Natal.

Head rather strongly punctured, eyes not contiguous at their apices; antennæ shorter than the head and thorax, six outer joints thickened and dilated, six lower ones fulvous, the rest black; labrum fulvous. Thorax nearly twice as broad as long at the base; sides obliquely converging and sinuate at the base, rounded at the middle, thence obliquely converging to the apex, hinder angles very acute; basal margin oblique and faintly bisinuate on either side, medial lobe strongly produced, slightly reflexed, its apex very acute; upper surface subconic, cylindrical at the apex, apical margin bordered by a transverse groove; strongly and closely punctured on the sides, more finely and less closely punctured on the disk. Scutellum narrowly ovate-lanceolate. Elytra scarcely broader than the base of the thorax, broadly oblong, slightly attenuated towards the apex, convex, closely covered with longitudinal rows of punctures; the interspaces plane, obsoletely convex near the outer margin. Prosternum slightly broader than long, the anterior border obliquely deflexed, the hinder margin truncate, very slightly concave, hinder angles produced, acute.

Cœnobius fulvipes.

Ovatus, valde convexus, piceus, nitidus; subtus obscurior, pedibus pallide fulvis; thorace fortiter, minus remote punctato; elytris tenuiter punctato-striatis, interspatiis ad apicem et ad marginem exteriorem convexis.

Long. 1 lin.

Hab.—India.

Eyes large, contiguous at their apices; two lower joints of antennæ pale fulvous;* face rugulose, fulvo-piceous, vertex black, labrum fulvous. Thorax rather more than twice as broad as long; sides rounded and quickly converging from base to apex, the hinder angles posteriorly produced, acute; basal margin oblique, bisinuate on either side, the medial lobe acute; above transversely convex, cylindrical at the apex; surface more coarsely and rather more

* The other joints in the only specimen known to me are broken away.

Digitized by Google

closely punctured than in *C. chinensis;* apical margin bordered with a deep transverse groove, basal margin narrowly edged with black, bordered with a single row of punctures, less defined than in *C. chinensis.* Scutellum narrowly ovate, its basal margin emarginate. Elytra scarcely broader at the base than the thorax, slightly attenuated towards the apex, convex, finely punctate-striate, striæ each impressed with a single row of fine linear punctures, narrowly and faintly sulcate on the inner disk, more strongly sulcate on the outer disk; the seventh stria from the suture oblique and joining the sixth stria below its middle; interspaces plane on the anterior portion of the inner disk, slightly convex towards the apex, more strongly convex for their whole length on the outer disk; basal margin edged with black, the apex rather paler than the disk. Body beneath dark piceous, legs pale fulvous. Prosternum nearly twice as broad as long, apex scarcely deflexed, hinder margin truncate, its lateral angles produced, acute.

Cœnobius chinensis.

Ovatus, valde convexus, niger, nitidus, antennis basi fulvis, pedibus anticis quatuor nigro-piceis; thorace fortiter, remote punctato; elytris regulariter sulcato-striatis, striis tenuiter punctatis, interspatiis convexis.

Long. $\frac{3}{4}$ lin.

Hab.—China; collected by Mr. George Lewis.

Eyes large, nearly contiguous, only separated at their apices by a very narrow line; antennæ scarcely longer than the head and thorax, the six outer joints slightly thickened, black, the five lower ones fulvous. Thorax rather more than twice as broad as long; sides converging and rounded from base to apex; basal margin very slightly bisinuate on either side, the medial lobe acute; above transversely convex, cylindrical at the apex; disk strongly but remotely punctured, apical and basal margins bordered, the former with a deep transverse groove, the latter with a single row of deep punctures. Scutellum ovate, emarginate at the base. Elytra slightly broader than the thorax, oblong, convex, regularly sulcate-striate, the striæ each impressed with a single row of fine punctures; interspaces convex, subcostate near the outer border, shining, impunctate.

Digitized by Google

Genus MONACHUS, Suffr.

Monachus angulicollis.

Breviter ovatus, valde convexus, niger, nitidus, facie inferiori, tibiis femoribusque anticis obscure rufis, subtus piceus; thorace rufo, lateribus angulatis; elytris distincte punctato-striatis, striis ad suturam et ad marginem lateralem sulcatis, interspatiis planis, externis convexiusculis.

Long. 1¼ lin.

Hab.—Columbia, Magdalena River.

Head finely granulose-rugose; eyes elongate, rather deeply notched; antennæ scarcely longer than the thorax, entirely black. Thorax twice as broad as long at the base; sides broadly margined, parallel and rather strongly sinuate from the base to the middle, thence obliquely converging to the apex, the two sections forming a distinct angle at the point of junction on the middle of the lateral border, apex of angle obtuse; basal border slightly oblique on either side, the medial lobe faintly reflexed, concave-emarginate; upper surface transversely convex, cylindrical at the apex, finely but distinctly punctured, the puncturing rather coarse along the basal margin; interspaces granulose-punctate. Scutellum more than twice as long as broad, narrowly wedge-shaped, its apex very acute, its basal margin obtusely rounded, entire. Elytra broader than the thorax, convex, finely strigose on the basal margin, rather strongly punctate-striate, striæ near the suture and on the outer margin sulcate; two outer interspaces slightly convex.

Monachus obscuricollis.

Breviter ovatus, valde convexus, niger, subtus nitidus; thorace pedibusque fulvis, tarsis piceis; supra minus nitidus, granulosus; capite nigro-piceo, rugoso, antennis flavis, extrorsum nigris; thorace obscure rufo, disco piceo infuscato; elytris punctato-striatis, striis pone medium deletis, striâ externâ integrâ, leviter sulcatâ.

Long. 1 lin.

Hab.—Pará.

Head nigro-piceous, tinged with cupreous, surface coarsely punctured, rugulose; antennæ scarcely half the length of the body, pale fulvous, the six outer joints black; labrum and palpi also fulvous. Thorax nearly twice as broad at the base as long; sides obliquely converging and slightly

Digitized by Google

rounded from base to apex, the hinder angles acute; above concave, cylindrical at the apex, finely granulose, impressed, but not closely, with fine punctures; in front of the basal margin is a row of coarse punctures, the margin itself thickened and slightly raised along its middle, causing the surface immediately in front to appear transversely grooved; surface obscure rufous, the disk deeply stained with piceous. Scutellum rather longer than broad, trigonate, its basal margin entire, its apex acute; surface nitidous. Elytra convex, each elytron transversely excavated immediately below the basal margin; surface minutely granulose, punctate-striate, the punctures distinct at the base, obsolete behind the middle; outer stria entire, slightly sulcate; interspaces plane, the outer one obsoletely convex.

Genus MELIXANTHUS, Suffr.

Melixanthus Adamsi.

Late quadrato-ovatus, postice vix attenuatus, fulvus, nitidus, antennis (basi exceptis), nigris; thorace basi anguste nigro-marginato, tenuiter sat remote punctato; scutello subcordiformi, apice acuto; elytris basi anguste nigro-marginatis, regulariter punctato-striatis, interspatiis planis, remote, tenuissime punctatis, leviter rugulosostrigosis; utrisque plagâ magnâ ovatâ male definitâ, supra discum exteriorem positâ, a paullo infra basin ad pone medium extensâ, piceâ instructis ♂.

Long. $1\frac{5}{6}$ lin.

Hab.—Danes Island, Canton River; collected by Mr. A. Adams, after whom I have named it.

Head rotundate, plane, distinctly punctured, vertex and front impressed with a longitúdinal groove; antennæ equal in length to the head and thorax, the basal joint thickened, curved, the second very short, submoniliform, the third and fourth each longer than the second, nearly equal, subcylindrical, the fifth to the eleventh compressed and dilated (the fifth rather less so than the others) and forming a narrow elongated club; the fifth to the ninth trigonate; the tenth and eleventh ovate; the two lower joints fulvous, the rest black; eyes elongate, remote, broadly but not deeply notched. Thorax twice as broad at the base as long; sides rounded and converging from base to apex, hinder angles posteriorly produced, acute; basal margin broadly and obtusely sinuate on either side,

Digitized by Google

medial lobe produced, broadly emarginate; above convex, remotely and very finely punctured; basal border narrowly edged with black. Scutellum subcordate, its apex acute, its basal margin deeply bilobate, narrowly edged with black. Elytra not broader than the thorax, convex, regularly punctate-striate; interspaces plane, finely but distinctly punctured, faintly rugulose-strigose over the whole surface; each elytron with a large ill-defined pale piceous patch placed on the outer disk, extending from just below the basal margin to beyond the middle; extreme basal margin black. Prosternum nearly twice as long as broad, its anterior margin produced, obliquely deflexed, sides sinuate between the coxæ, parallel towards the hinder apex, the latter distinctly concave, its lateral angles acute. Unguiculi piceous.

Melixanthus placidus.

Late quadrato-ovatus, postice vix attenuatus, valde convexus, fulvus, nitidus, antennis extrorsum nigris; thorace tenuiter, subremote punctato, basi anguste nigro marginato; elytris basi nigro marginatis, regulariter punctato-striatis, interspatiis planis, tenuissime, sat remote punctatis, irregulariter impresso-strigosis.

Long. 2 lin.

Hab.—China; collected by Mr. Lewis.

Head short, rotundate, finely punctured; eyes remote, elongate, broadly but not deeply notched; antennæ shorter than the head and thorax; the basal joint elongate, curved, the second and following three short, nearly equal in length, the second slightly thickened, the third and fourth cylindrical, the fifth compressed, slightly dilated, trigonate; the sixth to the tenth compressed, distinctly dilated, trigonate and forming with the ovate eleventh joint an ill-defined, elongate club; five lower joints fulvous, the six outer ones black. Thorax more than twice as broad as long at the base; sides rounded and converging from base to apex, hinder angles posteriorly produced, subacute; basal margin slightly bisinuate on either side, medial lobe slightly produced, broadly emarginate;* above convex, cylindrical at the apex, faintly excavated at the base on either side the medial lobe, very finely

* Owing to the bilobate base of the scutellum overlapping the margin of the thorax, it is impossible in the present, as in many other instances, to determine the exact shape of the emargination itself.

Digitized by Google

punctured; the extreme basal border narrowly edged with black. Scutellum elongate-trigonate, its apex acute, its base bilobed, narrowly edged with black. Elytra not broader at the base than the thorax, very slightly attenuated towards the apex, convex, regularly punctate-striate; interspaces plane, very minutely and somewhat sparingly punctured, covered with very finely impressed, irregular striæ. Prosternum oblong, the anterior margin distinctly produced, obliquely deflexed; the sides sinuate in front, parallel posteriorly, the hinder apex truncate, slightly concave, the lateral angles acute, rectangular. Unguiculi black.

Genus CRYPTOCEPHALUS, Geoff.

Cryptocephalus Jansoni.

Oblongus, subcylindricus, niger, nitidus, pygydio apice flavo-albo; capite crassè punctato, utrinque puncto infra oculum flavo; thorace sat fortiter, subremote punctato; margine basali, vittis duabus latis, intus plus minusve excavatis, ante apicem abbreviatis, et utrinque puncto intra marginem, nigris; elytris piceo punctatis, punctis ad basin et prope suturam in striis biseriatis, confuse dispositis; margine basali, lineâ suturali et utrisque maculis duabus, unâ supra callum humerale, alterâque pone medium positis, nigris.

Var. A. Capitis punctis flavis obsoletis.

„ B. Elytrorum maculâ posticâ obsoletâ.

Long. 3—3½ lin.

Hab.—China, Shantung.

Head rugose-punctate; clypeus campanulate, its apical margin slightly concave; antennæ nearly equal to the length of the body in the ♂, shorter in the ♀; black, the apex of the basal and the whole of the second joints obscure piceous. Thorax rather more than one-half broader than long at the base; sides rounded and converging from base to apex, nearly parallel at the extreme base; hinder margin concave on either side, medial lobe broadly emarginate; above convex, finely punctured on the disk, more coarsely so on the sides; basal lobe slightly reflexed. Scutellum smooth, subtrigonate, its apex broadly truncate, its base bilobate. Elytra scarcely broader than the base of the thorax, quadrate-oblong, sides only moderately lobed; convex, slightly thickened round the hinder part of the scutellum, slightly excavated at the base, finely but

Digitized by Google

distinctly punctured, the punctures piceous, arranged in double rows at the base and along the suture; the second black spot on the elytron (when present) is rotundate and placed below the middle, half-way between the suture and outer margin, the spot on the humeral callus is oblong; the inflexed limb is stained behind the middle with nigro-piceous. Apical segment of abdomen in the ♂ impressed with a large shallow fovea, the anterior edge of which is armed with a flattened tooth; the same segment in the ♀ is impressed with the usual deep fovea.

In colour this species closely agrees with *C. Japanus*. It is much smaller, and in its typical form has only two instead of four black spots on each elytron.

Cryptocephalus notatipennis.

Elongato-ovatus, convexus, obscure fulvus, nitidus, capite flavo, antennis (basi fulvâ exceptâ) oculisque nigris; pectore abdomineque (hujus apice excepto) pallide piceis; scutello elytrisque violaceo-piceis; thorace lævi, margine antico lateribusque flavis; elytris sat fortiter punctato-striatis, interspatiis planis, duobus externis convexis; utroque elytro vittâ interruptâ, pone medium abbreviatâ, disco exteriori positâ, maculâque subapicali fulvis, ornato.

Var. A. Elytris pallide piceis, signaturis ut in typo.

Long. $\frac{3}{4}$ lin.

Hab.—Pará. Var. A. Santarem.

Head smooth; eyes elongate, not contiguous, broadly sinuate, black; antennæ scarcely more than half the length of the body in the ♂, slightly shorter in the ♀; slender, five lower joints flavous, the six outer ones very slightly thickened, black. Thorax about a third broader than long at the base; sides rounded and converging from base to apex, more quickly converging near the latter; basal margin deeply sinuate on either side, the lateral angles produced posteriorly, very acute, medial lobe bi-emarginate; above very convex, smooth and shining, impressed with a few minute punctures, only visible under a deep lens; basal margin faintly strigose, more or less edged with piceous; sides irregularly bordered with flavous, the extreme lateral margin sometimes narrowly edged with piceous; anterior margin narrowly edged with flavous, impressed with a single row of deep punctures. (The flavous markings on the sides and apex vary greatly in different individuals, and are sometimes entirely obsolete.)

Digitized by Google

Scutellum narrowly wedge-shaped. Elytra convex, sides moderately lobed; each impressed with ten rows of distinct punctures, larger and deeper towards the lateral margin; the seventh row from the suture nearly obsolete, being only visible on the lower portion of the humeral callus; interspaces plane, here and there faintly wrinkled, two outer ones thickened, convex; outer disk of each elytron with a subapical spot, also with a more or less interrupted vitta, commencing on the basal margin and extending to just below the middle, fulvous. These markings frequently form three small fulvous spots, placed one at the base, one on the middle, and the third just before the apex of the elytron.

Similar in form to *C. flagitiosus*, Suffr., near which it must be placed.

Cryptocephalus gratus.

Subelongatus, subcylindricus, pallide rufo-piceus, nitidus, antennis (basi fulvâ exceptâ) nigris; scutello elytrisque obscure piceo-cæruleis, his fortiter punctato-striatis; utrisque apice plagâque magnâ oblongâ a paullo infra basin ad ultra medium productâ, flavis ornatis; thorace lævi, utrinque ad latus leviter transversim sulcato.

Long. 1¼—1¾ lin.

Hab. Brazil, Parana.

Head smooth, impressed on the front between the eyes with a few distinct punctures; eyes large, black, not contiguous; antennæ more than two-thirds the length of the body, moderately robust, five lower joints fulvous, stained above with piceous, the rest very slightly thickened, black. Thorax nearly twice as broad at the base as long; sides distinctly margined, converging and slightly rounded from base to apex, faintly sinuate in the middle, hinder angle posteriorly produced, acute; hinder margin slightly concave on either side, medial lobe scarcely produced, its apex bi-emarginate; disk convex, smooth, impunctate, impressed just behind the middle on either side near the margin with a slight but distinct, obliquely transverse groove. Scutellum narrowly wedge-shaped. Elytra oblong, sides only slightly lobed; above convex, each elytron with eleven rows of strongly impressed punctures, the seventh to the ninth abbreviated anteriorly; the punctures on the flavous parts of the surface piceous; interspaces plane, the outer two convex; below the basilar space, near the suture, are a few faint transverse wrinkles.

Digitized by Google

Cryptocephalus histrionicus.

Anguste oblongus, subcylindricus, subtus cum capite sordide fulvus, pectore pallide piceo, vertice, antennis extrorsum oculisque nigris; supra pallide piceus, thoracis marginibus antico et laterali maculisque duabus baseos, sordide fulvis; elytris fortiter punctato-striatis; utrisque fasciâ transversa vix pone medium, utrinque abbreviatâ, postice leviter emarginatâ, maculâ ante apicem lineâque subapicali prope suturam positâ, albis, ornatis; his signaturis lævibus, impunctatis.

Long. 1 lin.

Hab.—Brazil, New Friburg.

Eyes large, separated at their apices by a narrow line; antennæ more than three-fourths the length of the body, four lower joints fulvous, the fifth piceous, the rest black. Thorax nearly twice as broad at the base as long; sides rounded and converging from base to apex, rather more obliquely converging before the middle, hinder angles produced posteriorly, acute; basal margin scarcely sinuate on either side, medial lobe not produced, slightly concave; upper surface convex, slightly impressed transversely on either side just behind the middle, coarsely but not very closely punctured. Scutellum wedge-shaped, its apex obtuse. Elytra oblong, sides slightly lobed; each elytron transversely excavated just below the basal margin, impressed with eleven rows of coarse deep punctures, rather smaller and less deeply impressed towards the apex; on the white markings these punctures are entirely obsolete; interspaces plane, convex and subcostate near the outer margin.

Cryptocephalus amazonus.

Elongatus, subcylindricus, niger, nitidus, capite (antennis extrorsum oculisque exceptis), thoraceque rufo-fulvis, pedibus flavo-fulvis; thorace subconico, utrinque oblique impressio, subremote punctato; elytris basi transversim excavatis, sat fortiter punctato-striatis; interspatiis planis, ad apicem convexiusculis, ad marginem exteriorem subcostatis.

Long. 1¼ lin.

Hab.—Pará.

Head rather strongly punctured; eyes nearly contiguous, being only separated by a fine line; antennæ rather more than half the length of the body, slender, the four lower joints pale flavous, the rest black. Thorax rather broader at the base than long, subconic; sides

Digitized by Google

slightly converging from base to apex, slightly rounded, the hinder angles acute; basal margin transversely truncate, the medial lobe not bi-emarginate; upper surface obliquely excavated on either side, rather coarsely but not closely punctured. Scutellum wedge-shaped, its apex obtuse. Elytra narrowly oblong, sides moderately lobed; each elytron transversely excavated immediately below the basal margin, strongly impressed with eleven rows of punctures, the seventh to the ninth rows from the suture abbreviated anteriorly; interspaces plane, slightly convex towards the apex, those on the outer margin thickened, costate.

This species must stand close to *C. esuriens*, Suffr.

Genus Stegnocephala, Baly.

Stegnocephala discoidalis.

Breviter ovata, valde convexa, fulva, nitida, antennis (basi exceptâ) scutelloque nigris, pectore, abdominisque basi piceis; elytris sat fortiter punctato-striatis, interspatiis planis, ad latus convexiusculis; nigro-purpureis, plagâ magnâ communi discoidali rufo-fulvâ ornatis; tarsis piceo tinctis.

Var. A. Elytris, basi exceptis, fulvis.
„ B. „ totis fulvis.

Long. 1¾ lin.

Hab.—Pará, Santarem.

Head smooth, impunctate; eyes black, contiguous in the ♂, slightly separated in the ♀; antennæ half the length of the body, slender, two to four lower joints fulvous, the rest black. Thorax when viewed under a lens, minutely but distinctly punctured. Scutellum trigonate, its apex acute; black, sometimes piceo-fulvous. Elytra rather strongly punctate-striate, the interspaces plane, those on the outer margin moderately convex; inflexed limb of lateral lobe rugose-punctate, opake; nigro-violaceous, a large common transverse patch on the middle disk, sometimes occupying nearly the whole surface of the elytra, fulvous or rufo-fulvous.

Genus Paracephala.

Corpus oblongum aut elongatum, subcylindricum. *Caput* in thoracem immersum; *oculis* subreniformibus, intus sat profunde angulato-emarginatis; *antennis* filiformibus, ad apicem vix incrassatis. *Thorax* transversus,

Digitized by Google

lateribus integris; convexus, apice sulco impresso marginatus; margine antico utrinque ad latus elevato. *Scutellum* oblongo- aut elongato-quadratum; basi bilobatum. *Elytra* oblonga aut anguste oblonga, parallela, lateribus valde lobatis; supra convexa, circa scutellum abrupte elevata. *Pedes* sat elongati; *unguiculis* basi incrassatis. *Prosternum* latitudine longior, postice bilobatum, antice deflexum, utrinque ab episterno antico, sulco distincto separatum; episterno antico angulo antero-interno libero.

Type *Paracephala pectoralis.*

This genus is at once known from *Ochrosopsis* by the deep groove separating the prosternum from the anterior episternum. *C. filum*, Chapuis, belongs to the present genus.

Paracephala pectoralis.

Subelongata, subcylindrica, nigra, nitida, prosterno bidentato flavo; abdomine, thoracis lateribus elytrorumque fasciâ vix ante medium, longe ante suturam abbreviatâ, rubris; thorace parce, hic illic fortiter punctato; elytris fortiter punctato-striatis, interspatiis ante medium transversim strigoso-rugulosis.

Long. 1¾ lin.

Hab. Australia; Cape York.

Vertex and face coarsely punctured; eyes not approximating, deeply notched; antennæ equal in length to the body ♂; fourth shorter than either the third or fifth, these latter equal in length, six outer joints slightly thickened; labrum piceous. Thorax twice as broad as long; sides nearly parallel and sinuate at the base, rounded and converging from behind the middle to the apex, hinder angles posteriorly produced, acute; basal margin concave on either side, medial lobe broadly truncate-emarginate; upper surface convex, nitidous, sparingly impressed here and there with coarse, deep punctures; apical margin bounded by a deep sulcation, the margin itself distinctly raised on either side. Scutellum subquadrate, its base emarginate. Elytra oblong, sides rather strongly lobed; upper surface thickened just round the scutellum, strongly and deeply punctate-striate, the inner striæ immediately below the scutellum confused; interspaces transversely wrinkled before the middle; medial fascia dilated on the outer margin, abbreviated inter-

Digitized by Google

nally between the third and fourth striæ from the suture. Prosternum pale yellow, longer than broad, its apex strongly deflexed, its hinder apex deeply emarginate, strongly bidentate.

Genus Euphyma.

Corpus oblongum aut subelongatum, convexum aut subcylindricum. *Caput* in thoracem insertum; *oculis* intus sat valde angulato-inscisis; *antennis* filiformibus, ad apicem vix incrassatis. *Thorax* transversus, convexus, lateribus integris. *Scutellum* trigonatum. *Elytra* thorace vix latiora, parallela aut postice vix attenuata, lateribus ante medium valde aut modice lobatis; supra circa scutellum elevata, striatim aut confuse punctata. *Pedes* mediocres. *Prosternum* latitudine longior, postice obtuse truncatum, angulis posticis obliquis; antice declive, utrinque ab episterno antico sulco distincto separatum; *episterno* antico angulo antero-interno libero.

Euphyma is separated from *Paracephala* by the obtusely truncate hinder apex of the prosternum, from *Ochrosopsis* and allied forms by the presence of the groove separating the prosternum from the episternum.

E. flaviventris, Saunders, *elegans*, Saunders, and several species as yet undescribed in my collection, form the above genus.

Genus Idiocephala, Saunders.

Idiocephala Chapuisii.

Subquadrato-oblonga, læte rufo-fulva, nitida, capite (facie inferiori exceptâ), scutello, genubus, tibiis tarsisque nigris; elytris crassè punctatis, transversim rugulosis, viridi-æneis, utrisque prope medium plagâ magnâ rufo-fulvâ, ornatis; antennis gracilibus.

Mas.—Antennis filiformibus corporis longitudinem valde superantibus.

Fœm.—Antennis corporis longitudinem æqualibus, articulis ultimis sex vix dilatatis.

Long. 2½—3 lin.

Hab.—Australia, Rockhampton.

In my collection and in that of the British Museum.

Vertex and front rugose, the latter with a raised longitudinal line; eyes large, deeply notched; lower face coarsely punctured, rufo-fulvous, clothed with griseous hairs; antennæ slender, filiform, longer than the body in

Digitized by Google

the ♂, of equal length to it in the ♀, the outer joints scarcely dilated in either sex. Thorax twice as broad as long at the base; sides broadly margined, rounded behind the middle, thence obliquely converging to the apex, the anterior angles acute, the hinder ones slightly produced backwards, subacute; basal margin slightly oblique on either side, the medial lobe broadly truncate; above convex, obliquely impressed on either side at the base, coarsely and deeply but not very closely punctured; lateral margin paler than the disk. Scutellum trigonate, its apex truncate, basal margin notched, surface smooth, impunctate. Elytra strongly lobed on the sides, contracted behind the middle; upper surface abruptly thickened round the scutellum, very coarsely and deeply punctured, the punctures near the apex arranged in longitudinal striæ; interspaces shining, transversely rugulose, longitudinally subcostate near the apex; each elytron near the middle with an ovate rufo-fulvous patch, placed rather nearer the suture than the lateral margin.

Nearly allied to *Idiocephala catoxantha*, Saunders; rather larger, the antennæ more slender and less distinctly thickened towards the apex in the ♀.

Idiocephala bella.

Subquadrata, valde convexa, fulva, nitida, pectore abdomineque piceo-fulvis; antennis extrorsum, vertice scutelloque nigris; thorace crassè, subremote punctato, utrinque ante basin leviter oblique impresso; elytris crassè punctato-striatis, punctis in striis confuse biseriatim dispositis, ad apicem minus fortiter impressis, interspatiis transversim rugulosis; utrisque fasciâ basali, maculâ magnâ pone medium, ad marginem adfixâ, margine apicali limboque inflexo nigris.

Long. $1\frac{2}{3}$ lin.

Hab.—Australia; Cape York.

Vertex impressed with fine longitudinal strigæ; front finely rugose on either side, its medial portion smooth, impunctate; antennæ rather more than half the length of the body, filiform, very slightly thickened towards the apex, the fifth joint piceous, the six outer ones black; eyes deeply notched. Thorax twice as broad as long; sides rounded and converging from base to apex; basal margin sinuate on either side, the medial lobe very slightly produced, entire; above convex, faintly impressed obliquely

Digitized by Google

on either side behind the middle, strongly and deeply punctured, the punctures irregularly congregated over the surface. Scutellum trigonate, its basal margin entire. Elytra scarcely broader than the thorax, sides strongly lobed; above convex, moderately thickened round the scutellum, coarsely punctate-striate, the punctures on the anterior half of the surface irregularly arranged in a double row on each stria, finer, and placed in single rows behind the middle; interspaces transversely rugulose, longitudinally subcostate on the outer margin near its apex. Body beneath clothed with adpressed silvery hairs.

Genus Rhombosternus, Suffr.

Rhombosternus pretiosus.

Elongatus, subcylindricus, ater, nitidus, capite (oculis antennisque gracilissimis exceptis) thoraceque rufo-testaceis; elytris sat fortiter, ad apicem seriatim punctatis, utrisque fasciâ latâ prope medium, ad suturam abbreviatâ plagâque apicali rufo-testaceis.

Long. $2\frac{1}{4}$ lin.

Hab.—Australia.

Face rather coarsely punctured, subrugose, vertex obliquely strigose on either side; labrum and palpi nigro-piceous; antennæ very slender, equal to the body in length in the ♀; third and fifth joints elongate, equal, each longer than the fourth; eighth and three following joints each shorter than the seventh, very slightly thickened and compressed; second to the fourth nigro-piceous, the rest black; eyes large, deeply notched: Thorax more than twice as broad as long; sides rounded and converging from base to apex, anterior angles produced into a lateral tooth, the hinder ones subacute; basal margin slightly bisinuate on either side, medial lobe broad, concave, bi-emarginate; upper surface transversely convex, deeply and obliquely excavated on either side, sparingly impressed with large deep punctures, which are irregularly congregated over the surface, the middle disk being nearly free from punctures. Scutellum trigonate, its apex broadly truncate; surface smooth, impunctate, apex with an obscure rufous patch. Elytra oblong, scarcely broader than the base of the thorax, sides only slightly lobed; upper surface thickened close to the scutellum, strongly punctured, the punctures less deeply impressed and

Digitized by Google

arranged in longitudinal rows towards the apex, interspaces between these striæ faintly convex, subcostate near the outer margin; on the rest of the surface they are transversely wrinkled; the rufous band extends on the outer border from below the shoulder to beyond the middle, irregular on the sides, it narrows towards the suture and terminates just before reaching the latter; the punctures on its surface, together with those on the apical patch, black; the terminal patch extends across the apex of the elytron, but is separated from the extreme edge by a narrow black line. Body beneath black, sparingly clothed with griseous hairs, sides of the thorax testaceous, the deflexed anterior border of the prosternum pale yellow. Prosternum longer than broad, the hinder apex dilated, broadly rounded; surface rugose-punctate. Apical segment of abdomen impressed with a large round fovea, ♀.

I possess three specimens of this pretty species, all belonging to the female sex; the male is unknown to me.

Genus Paracadmus.

Corpus elongatum, subcylindricum. *Caput* breve, rotundatum, in thoracem ad oculos insertum; *oculis* magnis, modice remotis, subreniformibus, intus profunde et anguste emarginatis; *antennis* filiformibus, corpus valde superantibus, ♂, articulo secundo brevissimo, articulo ultimo vix compresso, elongato-ovato. *Thorax* transversus, convexus, lateribus marginatis, irregulariter crenulatis. *Scutellum* cuneiforme, apice truncato, libero, dorso vix carinato, rugoso-punctato. *Elytra* anguste oblonga, lateribus ante medium modice lobatis, limbo inflexo pone medium angusto, ante apicem desinenti; supra convexa, circa scutellum abrupte incrassata, rugoso-punctata. Pygydium exsertum. *Pedes* sat elongati; *unguiculis* basi incrassatis. *Prosternum* latitudine longior, margine antico deflexo, margine postico concavo, utrinque in dentem acutum retrorsum producto. *Mesosternum* latitudini fere æquilongum, apice concavo, angulis posticis oblique productis, acutis.

Type *Paracadmus lucifugus.*

Separated from *Cadmus* and allies by the strongly bilobate hinder apex of the prosternum; from *Ochrosopsis* and *Idiocephala* by the crenulated margin of the thorax.

Digitized by Google

Paracadmus lucifugus.

Elongatus, subcylindricus, subtus nitidus, pallide albo-flavus, nigro-pictus; pedibus nigris, femoribus basi, posticis basi etsi infra tibiisque basi albo-flavus; supra niger, opacus; capite rugoso-punctato, pube sericeo vestito, oculorum orbitis internis, clypeo antice antennarumque articulis 6—10 sordide flavis; thorace convexo, profunde et creberrime rugoso-punctato, lateribus irregulariter crenulatis albo-flavo-marginatis, margine apicali (medio interrupto), discique maculis nonnullis sordide flavis; elytris crebre rugoso-punctatis, pone medium obsolete elevato-vittatis, fasciâ latâ communâ baseos, extus abbreviatâ alterâque prope medium, interruptâ, intus angustatâ, ad suturam abbreviatâ, sordide flavis; margine humerali limboque inflexo a basi ad longe pone medium, albo-flavis; pygydio flavo-albo, nigro notato.

Long. 2½ lin.

Hab.—Australia.

Head rugose, black, the upper and inner margin of the eye, the canthus, the cheeks and the lower portion of the clypeus obscure yellow; antennæ a third longer than the body ♂, slender, the second joint very short, the third to the tenth elongate, cylindrical, the eleventh slightly compressed, narrowly elongate-ovate. Thorax twice as broad at the base as long; sides rounded and converging from base to apex, sinuate behind the latter, anterior angles produced, subacute, curved slightly outwards, the hinder ones subacute, not produced; lateral margin irregularly but not coarsely crenulate; basal margin sinuate and slightly oblique on either side, the medial lobe slightly produced, deeply concave-emarginate; above convex, very closely and deeply rugose-punctate; lateral margin reflexed, broadly edged with yellowish-white, which colour extends for a short distance along the basal margin; an interrupted line on the apical margin, together with a few small indistinct spots on either side the hinder disk obscure fulvous. Scutellum wedge-shaped, its apex obtusely truncate, its surface carinate, coarsely punctured. Elytra scarcely broader than the thorax, oblong, sides rather strongly lobed; upper surface thickened just round the scutellum, very coarsely and closely rugose-punctate, obsoletely costate behind the middle; a broad common band at the base, abbreviated within the humeral callus, and a second about the middle of the elytron, well defined

Digitized by Google

on the outer margin, but narrowed and interrupted towards the suture, abbreviated at some distance from the latter, dull fulvous-yellow; outer edge of epipleural lobe, together with the inflexed limb from its base nearly to its apex, pale yellowish-white. Body beneath pale yellowish-white, clothed with adpressed griseous hairs; the middle of the breast, the pleuræ and a transverse basal line on the second and third abdominal segments, black. Pygydium rugose-punctate, yellowish-white, two small spots on either side and another at the base, black.

Genus Acolastus, Gerst.

Acolastus Simonsi.

Anguste oblongus, subcylindricus, niger, pube adpressâ albidâ vestitus; subtus nitidus, genubus tarsisque aurantaceis; supra subnitidus, capite thoraceque rugosis; illo fortiter punctato, mandibulis basi, labro, clypeo postice punctisque duobus inter oculos aurantaceis; hoc transverso, aurantaceo, lateribus antice rectis, basi oblique rotundatis aut obliquis; dorso rugoso-punctato, parce albido setoso, ante basin transversim depresso; utrinque vittâ latâ irregulari, ante apicem desinenti, unâ ante scutellum brevi (his vittis basi connexis), nigris; scutello transverso, trigonato, basi leviter elevato, ad apicem excavato; elytris glabris, crassè rugoso-punctatis, hic illic elevato-vittatis; aurantaceis, suturâ, callo humerali, maculâ inter basin et medium maculisque tribus pone medium, harum maculâ mediali communi, lateralibus ad marginem adfixis, fasciam interruptam formantibus, nigris, ornantibus.

Var. A. Thorace nigro, lateribus, apice intus dilatatis, maculâque apicali, disci medio positâ, aurantaceis.—*Mas.*

Long. 2 lin.

Hab.—Lake Nyassa; collected by Mr. Simons.

Head strongly and closely punctured, sparingly clothed with white hairs; clypeus more distinctly punctured, its apex deeply emarginate; eyes oblong-ovate, moderately sinuate, antennæ black, the third to the sixth joints obscure piceous. Thorax at its widest part nearly twice as broad as long; sides obliquely diverging for one-third their length, thence straight and scarcely converging to the apex;* basal margin distinctly sinuate on either side the

* In one of the two specimens before me the basal third of the lateral border is obtusely rounded; in the other it is nearly straight, and forms a distinct angle with the anterior portion.

Digitized by Google

medial lobe, the latter broad, transversely truncate; upper surface subcylindrical, transversely impressed just in front of the basal lobe and for a short distance on either side; strongly rugose-punctate on the sides, rather more distantly punctured on the disk. Scutellum rather broader than long, trigonate, its apical angle obtuse; surface closely rugose-punctate, transversely thickened at the base, concave near the apex. Elytra oblong, very slightly attenuated towards the apex, the latter truncate, not dehiscent at the suture, sides only slightly lobed; above convex, flattened along the suture, faintly depressed transversely below the base and again below the middle, the basal margin close to the scutellum, together with the truncate apical border thickened; surface deeply and closely punctured, interspaces thickened and irregularly rugulose; on each elytron are several raised longitudinal vittæ, fine and indistinct on the disk, thickened and forming irregular rugæ at the apex.

Genus METALLACTUS, *Suffr.*

Metallactus eximius.

Subquadrato-oblongus, valde convexus, flavus, nitidus, metathorace utrinque maculâ, scutello, verticis maculâ, oculis antennisque (articulis duobus ultimis exceptis), nigris; elytris irregulariter punctato-striatis, punctis piceis; striis prope suturam et iis disci exterioris confusis; utrisque plagâ basali longitudinali, intra callum humerale positâ margineque humerali nigris.

Long. 2—2½ lin.

Hab. Banks of the Amazon, Pará, Santarem.

Vertex smooth, minutely but not closely punctured; front narrow, impunctate, impressed with a medial longitudinal groove; eyes large, oval, deeply notched; antennæ half the length of the body, rather longer in the ♂, filiform, scarcely thickened towards the apex; the eyes, interocular canthi, the apices of the jaws and a large trigonate patch on the vertex black; antennæ also black, the two upper joints flavo-fulvous. Thorax more than twice as broad as long; sides rounded and converging from base to apex, all the angles produced laterally into a subacute tooth; basal margin straight on either side, medial lobe slightly but distinctly produced, broadly truncate; above transversely convex, remotely impressed with deep punctures. Scutellum trigonate, its apex truncate.

Digitized by Google

Elytra rather broader than long, oblong-quadrate, the sides rather strongly lobed; above convex, slightly thickened just round the scutellum, strongly punctate-striate, the punctures piceous, the puncturing confused near the suture, and also on the median line of the inner disk. Body beneath very sparingly clothed with adpressed hairs. Abdomen pale yellow. Anterior pair of thighs thickened. Prosternum faintly grooved longitudinally on either side, its hinder apex obtusely angulate.

Genus PACHYBRACHYS, *Suffr.*

Pachybrachys contortus.

Oblongus, subcylindricus, pallide piceus, albido variegatus, nitidus; thorace sat profunde, subremote punctato, ante basin transversim excavato, albido et piceo-variegato; elytris albidis, sat fortiter punctato-striatis, striis piceis, hic illic contortis, disco exteriori interruptis; interspatiis lævibus, hic illic dilatatis et maculas irregulares formantibus; antennis piceis, extrorsum nigro-piceis.

Long. 1¾ lin.

Hab.—Banks of the Amazon, Pará, Santarem. Apparently common.

Head sparingly clothed with griseous hairs, coarsely and rather closely punctured; yellowish-white; the punctures piceous; space between the eyes impressed with a longitudinal punctured groove; eyes large, reniform, the notch angular; antennæ three-fourths the length of the body in the ♂, shorter in the ♀, slender; the basal joint ovate, yellowish-white, the rest piceous; five or six outer joints nigro-piceous. Thorax nearly twice as broad as long at the base; sides straight, obliquely converging from base to apex, all the angles acute; basal margin sinuate on either side the medial lobe, the latter slightly produced, very obtusely rounded; upper surface transversely convex, transversely excavated on the hinder disk, coarsely and deeply, but not very closely punctured; general surface pale piceous, a broad irregular lateral vitta, extending more or less along the apical margin, and an irregular longitudinal patch on the middle of the disk, extending from base to apex, white. The extreme outer limb piceous. Sometimes the general surface is white, with the extreme outer limb and an ill-defined oblique vitta on either side the disk pale piceous. Scutellum elongate-trigonate, its apex truncate, pale yellow-

Digitized by Google

ish-white, narrowly edged with piceous. Elytra very slightly broader than the base of the thorax, sides only slightly lobed; above convex, thickened on the basal margin and immediately around the scutellum; strongly punctate-striate, the striæ sulcate, piceous, contorted below the scutellum and again on the median line of the outer disk; in this latter place they are very irregular and much interrupted; interspaces smooth, impunctate, slightly thickened, white, with a faint yellowish tinge; below the scutellum and in the middle of the outer disk they are separated by the contortions of the striæ into irregular white patches, the most conspicuous of which are; one trigonate and distinctly thickened, placed on the sutural margin, just below the scutellum, and a second on the outer disk, also trigonate, its base placed on the extreme lateral stria, and its apex extended rather more than a third across the disk; the apices of the elytra smooth and entirely free from punctures. Body beneath sparingly clothed with griseous hairs, pale fusco-piceous, marked here and there with ill-defined white patches.

Closely allied to *P. clathratus*, Suffr. The thorax broader and more distinctly punctured.

Digitized by Google

XVII. *Notes on the new or rare* Sphingidæ *in the Museum of the Royal Dublin Society, and Remarks on Mr. Butler's recent revision of the Family.* By W. F. Kirby, Assistant Naturalist, R.D.S.

[Read August 1st, 1877.]

The Royal Dublin Society's collection now contains nearly 300 species of *Sphingidæ*, among which are several new species which I describe below. I have also taken this opportunity to mention the very few species or synonyms which are unnoticed by Mr. Butler in his recent revision of the group in Trans. Zool. Soc. ix., and to enumerate those species in the Dublin collection which are interesting from their rarity, or from their being at present unrepresented in the British Museum, for it is always useful to know in what other public collections the desiderata of our great National Museum may be examined.

Macroglossinæ.

Hemaris Fuciformis, Linn. (= *Sphinx Tityus*, Linn.; = *Sphinx Musca*, Retz.)

H. Ruficaudis, Kirb. (= *Hæmorrhagia Buffaloensis*, G. & R.; and *H. Uniformis*, Grote).

H. Kingii, Macl. (= *Cunninghami*, Boisd. nec Walk.) Australia.

Two specimens of this very distinct species.

H. Cyaniris, Guér., Ic. R. Anim. texte. ii. p. 495 (1844), infra. Sylhet, Mauritius.

H. Croatica, Esp. Dalmatia.

Macroglossum Affictitia, Butl. Ceylon.

„ *Vialis*, Butl. Hab. (?)

„ *Luteata*, Butl. Ceylon.

Sphinx Pandora, Fabr., is not quoted by Butler. Fabricius quotes *S. Passalus*, Drury, as a synonym, but his description appears to apply better to some species allied to *Belis*, Linn.: I will not attempt to

Digitized by Google

decide which. Butler seems to have also overlooked *Perigonia Passerina*, Boisd. Lep. Het. p. 327, hab. (?)

Himantoides Undata, Walk. Jamaica.

As this was described by Walker from a specimen wanting hind wings and abdomen, I have redescribed it below. The British Museum now possesses a perfect specimen, and I hope Mr. Butler will soon characterize this interesting genus from it.

Proserpinus Gorgon, Esp. S. Russia.
Temnora Excisa, Walk. Natal.

Described by Walker as an *Enyo*, and referred by Butler, with doubt, to the already sufficiently heterogeneous genus *Lophura*. It is evidently closely allied to *T. Rhadamistus*, Fabr., as figured by Boisduval. (*Temnora plagiata*, Walk.; = *Confusa*, Walk.; = *Dicanus*, Boisd. Voy. Deleg. ii. p. 594, n. 101 (1847).)

Calliomma Pluto, Fabr.; = *Sph. Pluto*, Gen. Ins. p. 274 (1777); Zschach, Mus. Lesk. p. 95, t. 3, n. 184 (1788); = *Sphinx Crœsus*, Dalm. Anal. Ent. p. 48, n. 22 (1823); = *Oreus Thorates*, Hübn.

The above is the correct synonymy of this well-known insect. *C. Pluto*, Cram., must retain Hübner's name of *Plutonius*.

Enyo Gorgon, Cram. Brazil.
„ *Lyctus*, Cram. Upper Amazons.

Three specimens, agreeing with the figures of Cramer and of Herrich-Schäffer. There are certainly at least two species represented, and I am at present inclined to regard *Lyctus*, H. S., as the ♂ of that of Cramer.

Aleuron Butleri, sp. n., infra. W. Indies.

Chærocampinæ.

Acosmeryx Miskini, Murray. Australia.

Two specimens, one larger and darker than the other. *Enyo Cinnamomea*, H. S., mentioned by Butler, Trans. Zool. Soc. ix. p. 542, is probably an over-coloured figure of this, and would then take priority. *A. Miskini* stands as *A. Cinnamomea*, H. S., in the collection of Herr Maassen of Elberfeld, who considers *Daulis*, Boisd., to be also synonymous. The notice of *A. Naga*, Moore, Cat. Lep. E. I. C. i. p. 271, was, I am informed by Mr. Butler, accidentally erased in his MS.

Digitized by Google

Otus Versicolor, Harr. Canada.

A new locality for this rare species.

Pergesa Castanea, Moore. India.
Panacra Ella, Butl. Sylhet.

So much greener than the figure that I was about to describe it as distinct. We have a closely-allied species, perhaps *P. Testacea*, Walk., from the Andamans.

(*Diodosida Murina*, Walk. = *Lophura Tyrrhus*, Boisd. Voy. Deleg. ii. p. 594, n. 103 (1847).)

Chærocampa Elpenor, Linn. (= *Sph. Porcus*, Retz.)
„ *Capensis*, Linn. (= *Sph. 8-maculata*, Gmel.)
„ *Neoptolemus*, Cram. Colombia.
„ *Geryon*, Boisd. Hab.?

I cannot see any resemblance between this species and the figure of *Phœnyx*, H. S., to which Snellen seems inclined to refer it.

Chærocampa Saclavorum, Boisd. Madagascar.
„ *Oldenlandiæ*, Fabr. (= *S. Argentata*, Haw. Ent. Trans. i. p. 334 (1812); *Deil. A.*, Steph. Ill. i. p. 130, n. (1828); Wood, Ind. Ent. Suppl. f. 28 (1839).)

Among other specimens are three labelled "Africa," which appear to belong to this species, and not to *Gordius*, Cram.

Chærocampa Margarita, n. sp., infra. Australia.
„ *Rosina*, Butl. Ceylon.
„ *Latreillii*, Macl. (= *Comminuens*, Walk.)
„ *Aspersata*, n. sp., infra. Andamans. (*C. Butus*, H. S., Ex. Schmett. ii. f. 559, probably = *C. Punctivenata*, Butl.)
„ *Alcides*, Boisd. Brazil.

I do not believe this species to be the same as *Anubus*, Cram., though Butler considers them identical. There are several closely-allied species of this group, including *C. Moeschleri*, Ersch. Trud. Russk. x. pl. 1, f. 1, intermediate between *Alcides* and *Maculator*. The true *Anubus*, though known to and described by Boisduval, does not appear to be contained in British collections. *C. Mexi-*

Digitized by Google

cana, Ersch. l. c. f. 2, is, as Mr. Butler informs me, synonymous with *C. Falco*, Walk.

Chærocampa Isaon, Boisd. Cayenne.
„ *Maculator*, Boisd. Colombia.
„ *Tyndarus*, Boisd. Hab.?

A single bleached specimen.

Chærocampa Johanna, n. sp., infra. Brisbane.

This species, with *Scrofa*, *Ignea*, *Brennus*, and *Yorkii*, forms a little group almost peculiar to Australia. Boisduval appears to have been in error in stating that he described *C. Yorkii* from the British Museum collection; but his description will no doubt be applied to the proper insect as soon as it is rediscovered. I see no reason to consider it a fictitious species. *C.? Ploetzi*, Möschl. Verh. z. b. Wien. xxvi. p. 350, pl. 4, f. 35, from Surinam, has been described since the publication of Butler's revision. In the same paper Möschler describes and figures *Tylognathus Carinatus*, Walk., and *T. Chloroptera*? Pert. (p. 349, pl. 4, ff. 33, 34).

Chærocampa Erotus, Cram. v. *Andamanensis*, infra. Andamans.
Deilephila Opheltes, Cram. Cape.

A small specimen, measuring only 2½ inches in expanse; Cramer's figure is an inch larger. But all the *Deilephilæ* appear to vary considerably in size.

Deilephila Zygophylli, Ochs. S. Russia.
„ *Hippophaes*, Esp. (=*Amelia*, Feisth. Bull. Sci. Nat. 1827, p. 162).
Daphnis Angustans, Feld. Queensland; Brisbane.

Felder's specimens came from the Moluccas (Amboina, according to Boisduval).

Philampelus Pandorus, Hübn. (= *P. Ampelophaga*, Harr. Amer. J. Sci. xxxvi. p. 300, n. 4 (1839)).
„ *Lacordairei*, Boisd. Madagascar.

A single specimen. It appears to be distinct from *P. Megæra*, Linn., but as the latter is evidently a very variable species, it would require a series of *Lacordairei* to point out the differences properly.

Pachylia Lyncea, Clem. Brazil, Amazon, Barbadoes.
P. Undatifascia, Butl., may be the same as this species.

Digitized by Google

P. Inconspicua, Walk. (?) Jamaica.
Oryba Robusta, Walk. Ucayali.

Sphinx Achemenides, Cram., is evidently closely allied to this species, which was placed by Boisduval in *Pachylia*, to which it is clearly related. A drawing of *O. Robusta* was lately sent me by Erschoff as *P. Kadeni*, Schauf., but I have not been able to consult the description of the latter.

Ambulicinæ.

Ambulyx Eurycles, Herr Schäff. S. America.
„ *Lycidas*, Boisd. Brazil.
„ *Crethon*, Boisd. Hab. —?

Smerinthinæ.

Metamimas Banksiæ, Boisd. S. Australia.
Polyptychus Timesius, Stoll. N. China; India (= *Sph. Modesta*, Fabr., E. S. iii. 1, p. 356, n. 4 (1793)).

The legs of this species are very thick and strongly spined.

The earliest notice of *Lophostethus Dumolinii* is by Latreille, Cuvier's Regne Animal, ed. 2, vol. iii. pl. 20, f. 1. (1830), as *Sphinx Dumolin.*

Calasymbolus Astylus, Dru. N. America.
Smerinthus Ocellata, Linn. (= *Sph. Semipavo*, Retz.)
„ *Tatarinovii*, Brem. (= *Smer. Eversmanni*, Popoff, Bull. Mosc. 1854, ii. p. 182, pl. i. f. 5).
Basiana Exusta, Butl. Cashmir.

Walker quotes a record that his *B. Postica*, from Natal, "gives out sounds resembling those of a *Lamia*, for minutes together."

Acherontiinæ.

Acherontia Medusa, var. Malacca.

Resembles Japanese rather than Chinese examples, and is as dark as these above and below. The inner black band of u. s. h. w. sends off a very distinct branch near the costa to the discoidal spot.

Acherontia Sculda, n. s., infra. Borneo.

Digitized by Google

SPHINGINÆ.

Amphonyx Rivularis, Butl. Upper Amazons; Mexico.

The Mexican specimen is much larger than any of the others.

Anceryx Alope, Dru. (? Cram.) (= *Sphinx Flavicans*, Goeze, Ent. Beytr. iii. 2, p. 216, n. 44 (1780)).
Isognathus Menechus, Boisd. Brazil.
Dilophonota Merianæ, Grote. Colombia.
Macrosila Lefebvrei, Guér. (= *Incisa*, Walk.) Brazil.
Protoparce Dalica, n. s., infra. Canada.
„ *Cingulata*, Fabr. (= *Sphinx Affinis*, Goeze).
„ *Quinquemaculatus*, Haw. (= *Celeus*, Hübn.)
„ *Sexta*, Johannsen (= *Carolina*, Linn.).

The Am. Ac. vi. and Mus. Ulr. are both dated 1764; but as Linné quotes the former, its priority is established.

P. Abadonna, Fabr. Queensland.

This is a species measuring 3¼ inches across, and resembling a small *Convolvuli*, from which it may be at once distinguished by the absence of the rosy spots on the abdomen. It is well described by Macleay as *Sphinx Godarti*, in King's Australia, and I therefore consider a further notice superfluous. It agrees better with *S. Abadonna*, Fabr., than any other species known to me; and the locality of the latter (East Indies) is also sufficiently near.

P. Pseudoconvolvuli, Schauf.

Small pale *Convolvuli* from Natal and Abyssinia may perhaps be identical with Schaufuss' insect.

Diludia Pamphilius, Cram. Upper Amazons.

A pair of what I believe to be this species. It seems to be intermediate between *Brontes*, Dru., and *Lichenea*, Walk.

Diludia Bethia, n. s., infra. Queensland.
„ *Nebulosa*, Butl. Sikkim.

(*Hyloicus Dynæus*, Hübn. Zutr. ff. 463, 464, appears to have been overlooked by Mr. Butler.)

Digitized by Google

Sphinx Luscitiosa, Clem.? N. America.
Does not quite agree with Strecker's figure.
(*Sphinx Snelleni*, Weyenb. Mus. Teyl. ii. p. 261, t. 34, ff. 9, 9*a*. I have copied an incorrect reference to this fossil species into the Zool. Record as *S. Snelli*.)

The following five Sphinges are not noticed by Butler:

S. Pagana, Fabr. Sp. Ins. ii. p. 146, n. 29. (The type should be in the Banksian collection.) E. Indies.
S. Jasmini, Boisd. Lep. Het. i. p. 114. Madagascar.
S. Orneus, Westw. Cab. Or. Ent. t. 6, f. 3. India.
S. Sanguinosa, Martyn, Psyche, t. 26, ff. 68, 69. Tranquebar.
S. Argentiflua, Mart. l. c. t. 29, ff. 83, 84. S. America.

Nephele Œnopion, Hübn. Madagascar.
„ *Densoi*, Kef. Madagascar.

Allied to *Variegata*, Butl., but with more regular markings. I am uncertain whether or not this is the insect described by Boisduval, Faun. Mad. p. 75, as *Deilephila Morpheus*, Cram.

Nephele Charoba, n. s., infra. Madagascar.
„ *Argentifera*, Walk. Natal.
„ *Infernalis*, sp. n., infra. Ashanti.
„ *Vau*, Walk. Ambriz, Congo.

Differs a good deal in colour; the hind wings are sometimes greenish, with a dusky border, and sometimes more or less suffused with reddish on the outer half. The pale portions of the fore wings have a delicate bloom on them, similar to that often seen on bred specimens of *Smerinthus Populi*.

Descriptions of New Species.

Hemaris Cyaniris, Guér.

Exp. al. 2 in. Allied to *H. Hylas*, Linn.; antennæ and wings as in *Hylas;* thorax and opaque portion of base of wing more olive-green, abdomen duller, slightly inclining towards reddish, anal tuft reddish, yellow at the base beneath, and with a blackish spot at the base on each side. Under-surface, including the legs, and the base of the wings yellow, inclining to orange.

Digitized by Google

Sylhet. Maassen in mus.; Mauritius, Guérin. Our specimen is erroneously labelled Brazil. I am indebted to Prof. Westwood for the identification of this species.

The uniform coloration of the under-surface, the absence of any belt on the abdomen, and the colour of the anal tuft will at once separate this from any other species of the *Hylas* group.

Himantoides Undata, Walk.

Exp. al. 1½ in. Body brown, with two darker bands at the base of the abdomen. Fore wings banded with paler and darker bands, varying in intensity, and sometimes broken into spots. A white dot at the base, followed by a short black dash; a small black discoidal spot, generally containing another white dot. Hind wings rounded, black, with the centre luteous, widening out from the anal angle to the costa; fringes of hind wings luteous. Underside of fore wings brown, with a triangular luteous spot near the base; hind wings more or less luteous, costa and hind margin brown.

Jamaica. Two specimens.

Aleuron Butleri.

Exp. al. 2⅓ in. Allied to *Iphis*, Walk., and *Ypanemæ*, Boisd. Shape of *Iphis*, but the angle of the fore wings somewhat more obtuse. Fore wings pale brown, with a black dot at the base near the costa, and just beyond it, a large greenish-brown spot, enclosing a white dot on the costa. A broad band of the same colour, but paler across the middle of the wing, curving towards the base, and somewhat produced in this direction along the inner margin; upon this is placed a triangular silvery discoidal spot, and a dot above it. Outside the band is a dark line, angulated parallel with the hind margin. Hind wings pale brown, with a suffused black stripe across the middle, and a dusky line beyond it, corresponding to that on the fore wings. Hind margin bordered with brown towards the front angle. Underside paler, with a slight reddish tinge, and two dusky lines running across both wings.

West Indies. One damaged specimen.

Chærocampa Margarita.

Exp. al. 2¼ in. Allied to *Oldenlandiæ*, Fabr., and *Intersecta*, Butl. Thorax and abdomen greenish-brown,

Digitized by Google

thorax with a broad grey central stripe, silvery stripes at the bases of the fore wings, and intermediate gilded stripes. Abdomen with one central silvery stripe and two slightly gilded lateral stripes. Fore wings nearly as in *Oldenlandiæ;* a broad pearly-white stripe running from the middle of the inner margin to the tip, broadly edged with brown within and more narrowly without. Basal portion of the wing greyish and the marginal portion whitish, the latter intersected by three obsolete lines; the broad stripe is also intersected by one, on the inner side, as in *Oldenlandiæ.* Hind wings blackish, pale towards the base, and with a pale stripe parallel with the hind margin. Underside as in small specimens of *Oldenlandiæ,* but redder.

Queensland. One specimen.

The single stripe on the abdomen will distinguish this species from *Oldenlandiæ,* and the broad pearly stripe of the fore wings from *Intersecta.* There is an unnamed specimen in the Brit. Mus. coll.

Chærocampa Aspersata.

Exp. al. 3½ in. Allied to *C. Clotho,* Dru., and *Gonograpta,* Butl. Body and hind wings as in *Clotho,* fore wings brown, varied with paler, and dusted all over with blackish scales; hind margin obscurely dusky. Outer line placed as in *C. Clotho,* between this and the black discal dot is a broader dusky line, suddenly angulated on reaching the costa. Underside of all the wings pale, speckled all over with dusky, with a broad dusky line running across them, corresponding to the one above, but extending nearly across the hind wings. Within this line the fore wings are much darker, except along the costa. The outer line and dusky hind margin are also faintly indicated on the underside of the fore wings.

Andamans. One specimen. (Mr. Butler considers this to be only a dark variety of *C. Clotho.*)

Chærocampa Johanna.

Exp. al. 2¼ in. Allied to *Brennus,* Cram., and *Ignea,* Butl., fore wings purplish-brown, with a broad darker central stripe bifurcated on the costa. A broad submarginal band of the same colour, the lower part interrupted by a large pinkish spot. Towards the base are some short dusky markings. Hind wings red, with brown hind margins as in *Ignea.* Underside yellowish-red, the hind margins dusky, and a dusky stripe across the hind wings, and three dusky marks on the outer half of the

Digitized by Google

costa. Thorax and abdomen rosy-grey, the sides of the latter with four red belts, broadly interrupted in the middle above; and with a patch of silvery scales, mixed with reddish ones, on each side, giving the appearance of four elongated silvery spots on each side of the hinder part of the abdomen.

Brisbane. One specimen.

Chærocampa Erotus, Cram., var. *Andamanensis*.

Exp. al. 3¼—3½ in. Resembles var. *Erotoides*, Wallengr., but the hind margin of the fore wings is paler and more distinctly separated off by an obsolete blackish line, and the black border of the hind wings is a little broader. Underside yellowish, paler than in *Erotoides*, except towards base of fore wings; the whole surface dusted with black. Hind margins of both wings browner, following the outlines of the borders of the upper side and partly edged on fore wings by a black line running from the tip. One specimen has red hind wings above, and the underside of all the wings dull red, dusted with black, the hind margins shaped as in the others, but of a more purplish tint.

Body as in *Erotoides*; in the red specimen as in *Erotus*.

Andaman Islands. Three specimens.

Acherontia Sculda.

Exp. al. 4¾ in. Fore wings nearly as in *Medusa*, Butl., but less strongly dusted with grey; a reddish space along the middle of the inner margin. Hind wings straw-colour, hind margin black, with yellow spots between the nervures on the outside, but much smaller than in any other species; a narrow black line within, curving towards the anal angle. Head and thorax as in *Medusa*, a large black spot on each cheek of the skull. Abdomen with a very broad central bluish-black stripe, covering nearly the whole abdomen towards the extremity; a broad black band on each segment, broadest below, where it occupies as much space as the yellow, except just towards the tip. Underside of fore wings yellow, with a black border, and two obsolete transverse black lines, wider apart than in *Medusa*; hind wings nearly as in *Atropos*.

Borneo. One specimen.

Intermediate between *Atropos* and *Medusa*, but apparently distinct from both.

Digitized by Google

Protoparce Dalica.

Exp. nearly 4½ in. Allied to *Rustica*, Fabr., but the wings longer and narrower in proportion. Fore wings brown, slightly dusted with grey, crossed with irregular darker obsolete lines. Base and hind margin mottled with whitish, a triangular whitish blotch on the costa, surmounting a discoidal spot of the same colour; and another white blotch near the tip. Hind wings dark brown, greyish along the nervures, giving the wing the appearance of being crossed by two obscure greyish bands. All the fringes spotted with black and white. Body nearly as in *P. Rustica*. Underside of fore wings uniform brown, the discoidal spot indicated, yellowish. Outside this are two obscure darker transverse lines. Hind wings whitish at base, and rather more dusted with grey than the fore wings. Two transverse lines, more distinct than those on the fore wings, the outermost on the hind wings corresponding to the innermost on the fore wings.

Canada. One specimen.

Diludia Bethia.

Exp. 3¾—4½ in. Allied to *Casuarinæ*, Walk. Fore wings dusted with whitish-grey, fringes spotted with black. Three more or less conspicuous darker stripes (sometimes nearly obsolete), one within and one without the black discoidal spot, the former considerably angulated; the third runs from the inner margin at two-thirds from the base to the hind margin below the tip. From the tip runs a very conspicuous black line, like a black thread, nearly to the discoidal spot. Hind wings black, anal angle grey, fringes white. Underside greyish-white, more or less clouded with brown. Antennæ white above, brown beneath. Thorax greyish-white, with two black dots behind. Abdomen brown, dusted with grey, and with indications of a dark subapical, and broader lateral stripes. Underside uniform whitish-grey.

Queensland. Four specimens.

Nephele Charoba.

Exp. 3¼ in. Allied to *Densoi*, Kef.; fore wings uniform, silky brown, the hind margin marked off less broadly than in *Densoi* by a narrow greyish stripe, edged within with black. A silvery discoidal crescent; an

Digitized by Google

obscure blackish mark runs from it towards the anal angle. Hind wings tinged with greenish, hind margins darker; fore wings beneath brown at base, with the discoidal spot small, yellow; the marginal portion of the wing is darker than the space within it, and is marked off by a blackish line running from the tip. Hind wings paler than the fore wings; hind margin also marked off with a dark line. Body brown above, grey below; sides of thorax and orbits grey; first three segments of abdomen grey at the sides, each with a large black spot.

Madagascar. One specimen.

Another specimen, probably a variety, has the fore wings darker above and the hind wings more greenish; the discoidal spot is reduced to an inconspicuous dot, and the abdomen is uniformly spotted along its whole length; the underside is also darker, the hind margins are less distinctly separated, and there are two dark transverse lines on each wing, obsolete in the other specimen.

Nephele Infernalis.

Exp. about 3 in. Closely allied to the last; very dark smoky green; fore wings with a minute white discoidal dot; hind wings shading into black towards the hind margins. Even the usual marginal line of fore wings only indicated in one specimen by an obscure row of grey scales. Underside paler brown, inclining to greenish, especially towards base of hind wings. Fore wings with a transverse dark line on disk, and the usual marginal line running from tip; hind wings with two transverse lines. Thorax very dark green; abdomen nearly as in the last species, but uniform greenish-black above.

Ashanti. Two specimens.

Digitized by Google

XVIII. *Descriptions of new species of* Cleridæ. By the Rev. H. S. Gorham.

[Read August 1st, 1877.]

The following notes and descriptions of new species of *Cleridæ* form a sequel to a paper published in "Cistula Entomologica" in 1876. Their publication has been delayed, owing to unusual difficulties in unravelling the synonymy and identifying the types of various authors. I have had, however, the advantage of consulting the rich collection of Mr. Fry, whose liberality in placing his collection in my hands for that purpose I most gratefully acknowledge. This collection, as is naturally to be expected, is especially rich in South American novelties, many of them collected by his own hand. I have also, during the present spring, visited M. Chevrolat and inspected many of his types. My acknowledgments are also due to Major Parry for similar facilities by which this contribution to the history of the *Cleridæ* has profited.

List of New Species.

Epiphlœus Chevrolati.
" pulcherrimus.
" velutinus.
" terzonatus.
" capitatus.
" nitidus.
Lemidia rufa.
" obliquefasciata.
" dia.
" interrupta.
" maculicollis.
" *var.?* apicalis.
" elongata.
" sub-ænea.
" filiformis.
" suturalis.
" pilosa.
Lemidia concinna.
" bifurcata.
" labiata.
" plumbea.
Isolemidia, *nov. genus*.
" pulchella.
" Batesi.
" apicalis.
" subtilis.
Hydnocera marginata.
" Guatemalæ.
" flavifemorata.
" pallipes.
" rufithorax.
" virescens.
" olivacea.

Digitized by Google

CLERIDÆ.

Sub-family III. PHYLLOBÆNIDES.

SYNOPSIS OF GENERA.

A.	Palpi all hatchet-shaped	*Phyllobænus.*
AA.	Maxillary only do.	
a.	Antennæ not hairy	*Epiphlœus.*
b.	Ditto hairy	*Plocamocera.*

PHYLLOBÆNUS, Spinola.

Type, *P. dislocatus*, Say.

EPIPHLŒUS, Spinola.

Type, *E. duodecimmaculatus*, Klug.

Epiphlœus Chevrolati, n. sp.

Ferrugineus, capite thoraceque nigro-fuscis, elytris basi rufis, suturâ, apice, fasciisque duabus ad marginem attenuatis, albido-tomentosis, fusco irroratis. Antennis fuscis articulo basali testaceo.

Long. 3 lin.

Head and thorax pitchy-black, with greyish pile on the sides, the former very closely, the latter more sparsely punctured, elytra red at the base, with series of deep punctures for half their length, the remainder of the elytra is pitchy-black; bordered on the suture and towards the base, and with the apex and a central fascia whitish-grey, clothed with pile. Legs, basal joint of antennæ and underside red.

Allied to *balteatus*, Chev., but with the markings of the elytra more distinctly defined.

Hab.—Amazon. In my own collection, and Brit. Mus.—a fine series captured by Mr. Bates at Ega, who makes the following observation:—

"On trunks of felled trees, has a curious sidelong motion round the tree; found with small Coleoptera in the mouth, one with a *Copturus*, another with a *Scolytus*, and also a *Trypanæus*."

Epiphlœus pulcherrimus, n. sp.

Capite ferrugineo, pronoto fusco, elytris nigro-violaceis, basi punctatis ferrugineis, maculâ pone medium testaceâ

Digitized by Google

subrotundatâ, fasciâ posthac, apice et suturâ griseo-sericeis micantibus antennarum basi, corpore subtus pedibusque testaceis, femoribus posticis supra fuscis.

Long. 3½—4 lin.

Head rusty-red, coarsely punctured and slightly wrinkled; antennæ, with the basal, and sometimes the second joint red. Thorax shining fuscous or pitchy, sparingly punctured, pilose. Elytra (in the maturer of two examples before me) dark violet, rather coarsely punctured at the base, the punctures tending to form rows; a red spot near the base, unclothed; beyond the middle a pale spot nearly round, not reaching the suture but joined by the griseous pile with which it is covered, to the margin; a fascia and the apex of the same coloured downy pile. Legs and underside yellow, hind thighs infuscate above at the knees.

Hab.—Ega, Amazon (Bates); coll. Fry.

Epiphlœus velutinus, n. sp.

Capite cum thoracis margine antico castaneo, pronoto et pectore fuscis; elytris basi pallide testaceis, inde usque ad medium nigro-fuscis, dimidio apicali cinereo-testaceis, fasciâ pone medium uncinatâ, ad suturam interruptâ, maculâque parvâ ante apicem nigro-fuscis; abdomine testaceo, pedibus flavis, tibiis externe, femoribus anticis et posticis magis minusve infuscatis.

Long. 3—4 lin.

Head with a fine raised line from the crown to the clypeus in front, and in this part longitudinally subrugose. Antennæ fuscous, basal joint yellow. Front of the thorax with a few rugæ and punctures. Elytra finely and subseriate punctate at the base, the apical half scarcely visibly punctured, but clothed with fine grey downy pile, the margin near apex with ashy pile.

Hab.—Ega and Pará (Bates); coll. Fry and Gorham.

Obs.—This species is recorded by Mr. Bates as having the habits referred to under *E. Chevrolati*.

Epiphlœus terzonatus, n. sp.

Rufo-testaceus, thoracis disco antice, pectore, elytrisque fasciis tribus, maculâ prope basin, et margine (humero excepto) nigro-piceis; pedibus pallidis, tibiis omnibus

Digitized by Google

externe, femoribus anticis et posticis, subtus, nigro-notatis. Antennis fuscis, articulo basali flavo.

Long. lin. $3\frac{1}{4}$—$3\frac{1}{2}$.

Hab.—Ega (Bates); coll. Fry and Gorham.

Var. A. Thorace fusco, margine antico rufo, fasciâ secundâ latiore. Ega and village of S. Paulo, Amazon.

Var. B. Thorace toto fusco, antennis articulis primo et nono testaceis. Ega and S. Paulo, Amazon. Also from Mexico; coll. Gorham.

Obs.—A species agreeing with the type of my description stands in the Brit. Mus., named "*tomentosus*, Spin." His description, however, does not agree with the present insect, and is referred by Spinola himself to *variegatus*, Klug.

It is a variable species, and I should have been inclined to consider var. B. distinct had I only seen Mexican specimens. The coloration of the antennæ in this variety resembles that of *setulosus*, Thoms. An example in Mr. Fry's collection is intermediate between this and the type having the base of the antennæ with the ninth joint yellow and the disk only of the thorax dark.

Epiphlœus capitatus, n. sp.

Niger, subnitidus, capite pedibusque flavis his tibiis et tarsis anticis et intermediis femoribus anticis etiam subtus infuscatis; elytris striato-punctatis.

Long. vix 3 lin.

Allied to *sericeus*, Klug., but smaller and more parallel. The thorax is of the same colour as the elytra, which are leaden-black, without any violet tinge as in *sericeus*, the deep seriate punctuation of which will also distinguish this and the following from that species.

Hab.—Ega, Amazon (Bates); coll. Fry.

Epiphlœus nitidus, n. sp.

Testaceus, pectore, antennis, thoracis margine antico, elytris tibiis tarsisque quatuor primis nigro-fuscis; elytris parallelis, striato-punctatis, pube brunneo tenuiter vestitis.

Long. $2\frac{3}{4}$ lin.

Rather smaller than the preceding, and easily distinguished by the yellow thorax and body.

Hab.—Ega and Pará (Bates); coll. Fry.

Digitized by Google

PLOCAMOCERA, Spinola.

Type, *P. sericella*, Spin.

Some of the specimens found by Mr. Bates on the Amazon are fully twice as large as typical ones, being 3 lines long, but I can find no other specific difference.

Chev. refers *humeralis*, Sp., to *Plocamocera* with doubt; it is an *Epiphlœus*.

A specimen received from him as *Plocamocera militaris*, Chev., is *Epiphlœus sericeus*, Klug.

IV. HYDNOCERIDES.

SYNOPSIS OF GENERA.

A.	Club of antennæ two-jointed	*Hydnocera.*
AA.	Club of antennæ three-jointed.	
a.	Antennæ apparently eight-jointed	*Ellipotoma.*
aa.	Antennæ eleven-jointed; club distinct.	
b.	Thorax constricted before and behind ..	*Isolomidia.*
bb.	Thorax little constricted in front ..	*Lemidia.* *Emmepus.* *Thoane.*
aaa.	Antennæ eleven-jointed; club not distinct.	
c.	Elytra entire	*Evenus.* *Allelidea.*
cc.	Elytra abbreviated	*Paupris.*

EVENUS, Castelnau.

Type, *E. filiformis*, Cast.

LEMIDIA, Spinola.

Type, *L. nitens*, Newman.

It is astonishing how species of Cleridæ not even referable to the Hydnocerides have been described as *Lemidiæ*, apparently from a resemblance in the form of the head.

All the *Lemidiæ* yet known are from Australia or Tasmania; and I see no reason to expect it will be found elsewhere, unless it be in New Zealand.

Digitized by Google

Lemidia albofasciata, Thoms. G. & H. Cat. p. 1748.
„ *cyanea*, Thoms. G. & H. loc. cit.
„ *dorsalis*, Thoms. G. & H. loc. cit.

I have not seen these, but they belong without doubt to *Callimerus*, Gorh., Cistula Ent. 1876, p. 64.

Thomson recites the generic formula for *Lemidia*, but points out the affinity with *C. dulcis*, Westw., in which the eyes are deeply cut out.

Lemidia carissima, Pascoe. Journ. of Ent. i. 48.

A specimen of this in my collection has the sutural angle of the elytra spined as in *biaculeata*, Westw. It is, I suspect, the male.

Lemidia hilaris, Newm. Zool. 1843, p. 119. [Clerus.]

It is impossible to understand why Mr. Westwood suppressed this name in favour of a new one of his own *corallipennis* (Proc. Zool. Soc. 1852, p. 47), unless it was that he conceived it clashed with *Tillus hilaris*, White, Cler. App. p. 48. In that case, it was *hilaris* (Westw.), White, that should sink, Newman's *hilaris* being six years older. The two insects belong to different genera (see ante, p. 62), the present insect being, according to the type in Major Parry's collection, a true *Lemidia*. It may be convenient to observe here, that the species described by White in the Museum Catalogue, 1849, must be referred to that author, though Mr. Westwood has appropriated the authorship of them in his later descriptions and plates (Proc. Zool. Soc. 1852). Also that, in the latter place, they are not referred to genera which had then been characterized, except in a very speculative and misleading manner.

Dr. Le Conte's prefatory remarks (Synopsis of the Cleridæ, Ann. Lyc. of Nat. Hist., New York, 1849, v. 9—35) on the inconvenience of descriptions, without reference to the work of preceding authors, was surely prophetic. "Considering the rapidity with which unknown species —too likely in most cases to remain unknown—are named and diagnosed 'pour prendre date,' want of zeal is not to be numbered among the faults" *of succeeding authors.*

Lemidia inanis, Germ. = *Metabasis accinctus*, Newm. [Thanasimus], Cistula loc. cit., p. 75.

Digitized by Google

Lemidia insolata, Pascoe. Journ. of Ent. i. 48 = *Callimerus, id.* Cist. loc. cit., p. 67.

Lemidia xanthozona, Chev. Rev. et Mag. de Zool., 1874, p. 70 = *L. accinctus*, Newm., *Metabasis*, Gorh. (vide Chev. Mémoire, 1876, p. 7).

Lemidia pulverosa, Chev., and *L. semilutea*, Chev., loc. cit. These species from India are no doubt *Callimeri*, and not associable with *Hydnocerides*.

Lemidia rufa, n. sp.

Rufo-testacea, capite thoraceque vix nitidis elytris nigris subseriatim punctatis subrugosis, basi tenuiter, et fasciis duabus nec suturam nec marginem attingentibus (fere ut in *Lemidiâ nitente* dispositis), flavis, corpore supra pedibusque setosis.

Long. 2¾ lin.

In form and pattern of the elytra allied to *L. nitens*, but smaller.

Hab.—South Australia.

A single specimen in Mr. Fry's collection.

Lemidia obliquefasciata, n. sp.

Nigra, nitida, thorace (disco infuscato), abdomine (apice excepto), pedibus anticis et intermediis, elytris lineâ parvâ basali, fasciâ medianâ, sat latâ, obliquâ, interdum etiam maculâ minutâ apicali croceis; elytris subrugose punctatis, punctorum seriebus juxta suturam paululum substriatis.

Long. 2¾ lin.

Smaller and narrower than *festiva*, Westw. (Hope), from which the chief points of difference are that the fascia is narrower and obliquely directed from the margin towards the apex, the apical spot is usually quite wanting, the disk of the thorax has a dark spot; in the more brightly-coloured examples the front and middle legs are entirely yellow, in darker ones all the femora are infuscate.

Hab.—N. W. Australia, Freemantle; coll. Fry and Gorham.

Digitized by Google

Lemidia dia, n. sp.

Rufo-testacea, subnitida, parce pubescens pectore elytrisque nigris, his basi anguste, fasciâ mediana, apiceque læte aurantiacis, femoribus posticis in medio, tibiarum apice et tarsis infuscatis.

Long. 2¼ lin.

Head and thorax red, with a few setæ; of the same width, and equal to that of the elytra at their base; the latter widened to near the apex, with series of large, irregularly-shaped punctures not very closely packed and ceasing before the apex. Their base is entirely red, this colour extending to the humerus and a little way down the margin; the central fascia is entire, and wider at the suture, the marginal plica being nevertheless black. Apex rather widely red. A beautiful and very distinct little species.

Hab.—W. Australia (De Boulay).

A single specimen; coll. Fry.

Lemidia interrupta, n. sp.

Nigra, subnitida, parce subpubescens, capitis fronte, antennis, palpis, thorace, elytrorum basi, limbo usque ad medium tenuiter, macula in medio marginis triangulari, apiceque sanguineis; pedibus anticis rufis, intermediis et posticis nigris, illis genubus rufo-piceis.

Long. 2—2⅛ lin.

A very distinct species, rather shorter and wider than the preceding, the elytra are closely punctured in series terminating before the apex, the extent of the red markings varies a little in the two examples I have seen; the marginal plica is red below the shoulder and near the apex; the middle fuscia being represented by a triangular spot on the margin with the apex towards the suture.

Hab.—W. Australia (De Boulay), Freemantle; coll. Fry and Gorham.

Lemidia maculicollis, n. sp.

Rufo-testacea, corpore subtus nigro, prothorace punctis quatuor nigris, duobus discoidalibus, duobus juxta marginem posticam; elytris crebre punctato-striatis, pube brevi,

Digitized by Google

setisque nonnullis vestitis, basi late, maculâ apicali indistincte rufis, fasciâ medianâ lunuliforme cum hac conjunctâ interdum etiam ornatâ; femoribus basi (posticis fere totis) fuscis.

Long. $2\frac{1}{4}$—$2\frac{3}{4}$ lin.

Parallel, somewhat elongate, apparently variable from the two specimens before me. Thorax with two spots below the anterior constriction, and in one example (the type), with two others near the base; elytra in the type with the base broadly red, the remainder, with the exception of an ill-defined spot near the apex, of a dusky leaden hue, *the extreme apical margin white.* In the second example the humerus is tipped with black, the entire margin, apex, and a lunulate fascia, with the suture between it and the subapical spot red.

Hab.—Australia, Moreton Bay; coll. Fry.

Var.—*Apicalis.*

Præcedenti simillima, prothorace immaculato, elytris maculâ marginali post medium albidâ signatis.

Long. fere 3 lin.

Hab.—Moreton Bay; coll. Fry.

Possibly a distinct species, but I think only a variety of *maculicollis* being most nearly allied to the typical form; the femora are all black in their middle; the abdomen has three or four segments more or less rufous.

Lemidia elongata, n. sp.

Elongata subparallela, nigra, subnitida, ore, antennis, palpis, femorum basi, tibiis, tarsisque testaceis (abdomen deest); elytris nigro-piceis, crebre subseriatim punctatis, fasciâ abbreviatâ post medium paulo distinctâ ferrugineâ.

Long. 3 lin.

Head with the eyes very prominent, as wide as the elytra, finely granulated; crown with very obsolete impressions. Thorax longer than wide, sides very much widened, and rounded, impressed; disk, uneven, impressed before and behind. Elytra elongate, a narrow yellow line on their base from the shoulder to near the scutellum. The punctuation is serial, nevertheless becoming irregular both externally, and near the base; punctures often confluent.

Hab.—S. Australia; coll. Fry.

Digitized by Google

Obs.—The species in this section resemble *Hydnoceræ* more than their congeners do; they may easily be recognized by their three-jointed club of the antennæ.

Lemidia sub-ænea, n. sp.

Elongata subparallela, ænea vel nigro-violacea subnitida, fronte antennis palpis pedibusque pallide flavis.

Long. 3¼ lin.

Head with the eyes very prominent, as wide as elytra; owing to their size the crown appears somewhat depressed. Thorax uneven, finely but obsoletely punctured, the sides widened and rounded, but not so suddenly as in the preceding. Elytra very finely and closely punctured, not serially, clothed with a fine, short pubescence; underside of the same colour as above.

Hab.—New South Wales, Fry; Tasmania, in my own collection (e Mus. Saunders).

Obs.—Though the two specimens differ in colour, that from Australia being brassy-green, that from Tasmania black with a violet tinge; they agree so precisely in details I have no doubt they are one species.

Eumede æraria, Pascoe, Ann. and Mag. N. H. xvii. Jan. 1876. The distinction Mr. Pascoe gives for separating his type from *Lemidia* is not very satisfactory. The eye in *Lemidia* is not really entire, a small sinus close to the base of the antennæ being distinctly visible in most species; and there is nothing in the geographical habitat to preclude the supposition that his species belongs to the present section of *Lemidia*. Concerning the eye, vide Lac. Genera des Col. IV. 470.

Lemidia filiformis, n. sp.

Præcedenti affinis sed magis linearis; elongata, parallela, æneo-cuprea, subpubescens, fronte, antennis, palpis, pedibusque, rufis; thoracis disco subrugoso, elytris crebre irregulariter punctatis.

Long. 2½ lin.

Head, crown thickly punctured, face red. Thorax with the sides widened in the middle and rounded, but not so strongly as in *sub-ænea;* about half as wide again as long. Elytra scarcely as wide as the eyes, very parallel and elongate; thickly and evenly punctured, with grey

Digitized by Google

depressed pubescence, and erect hairs; humerus a little prominent. Legs, antennæ and mouth entirely ferrugineous red.

Hab.—W. Australia (De Boulay); coll. Fry. Unique.

Lemidia suturalis, n. sp.

Elongata nigro-picea, nitida, parce pubescens, fronte, antennis, palpis, pedibus anticis et intermediis ferrugineis, suturâ, fasciâque medianâ extus abbreviatâ, elytrorum basi, limbo ad basin et apicem tenuissime testaceis.

Long. 2—2¼ lin.

Head, excepting the crown, red. Eyes moderately prominent. Elytra widened a little from the base, punctate-striate, punctures detached and deep, suture rather widely, and a fascia a little beyond the middle, which is abbreviated to half the width of the elytra, testaceous; base and margin very narrowly yellow, except in the middle, hind legs black, excepting the extreme tip of femora and middle of tibiæ.

Hab.—W. Australia (De Boulay); coll. Fry.

Lemidia pilosa, n. sp.

Cuprea, dense cinereo-pubescens, obsolete crebre punctata, fronte, antennis, palpis, pedibusque pallide testaceis.

Long. 2½ lin.

Head with the eyes moderately prominent. Thorax sub-quadrate, sides angularly widened in the middle. Elytra at base about equal in width to the eyes, widened to extremity, their apical margin paler; the upper side is of a delicate dove colour, with a violet tinge, densely clothed with depressed shining ashy pile.

Hab.—Australia (Freemantle); coll. Gorham.

Easily distinguished from any of its congeners known to me, by the thick pile; the eyes are minutely cut out, and the antennæ clubbed just as in typical *Lemidiæ*.

Lemidia concinna, n. sp.

Nigra, nitida, glabra; fronte, antennis, palpis, femoribus basi testaceis; elytris basi, fasciâque medianâ, a suturâ interruptâ albis, apice piceo-marginato.

Long. vix 2 lin.

Head, with the face and mouth organs, testaceous. Antennæ, club four-jointed, stout. Thorax with the sides

Digitized by Google

rounded, lobate, a deeply-impressed constriction in front and before the basal margin; surface exhibiting setæ but not punctures. Elytra shining, uneven from shewing traces of very obsolete punctures. The basal white margin is wider near the scutellum, and the fascia is curved with its convex side towards the base, and is *raised and quite glabrous.*

Hab.—Australia, New South Wales; coll. Fry.

Obs.—The smallest *Lemidia* yet known to me, and very distinct by its shining black colour and white markings. It reminds one of certain small species of *Dromius.*

Lemidia bifurcata, n. sp.

Supra flavo-testacea, subtus nigra, capite toto cum antennis et palpis flavo; thoracis lateribus, scutello, elytrorum lateribus (maculis duabus vel uncibus, suturam non attingentibus annexis), nigris; elytris seriatim punctatis, pedibus pallidis.

Long. 2 lin.

Apparently nearly allied to *pectoralis*, White (to which I refer a species in Mr. Fry's collection from S. Australia), and from which it differs in the sides of the thorax being black. The elytra are very little wider behind than at their base, margined with black, and with two triangular spots pointing obliquely towards the suture and apex, united with the margin, of the same colour. The abdomen is quite black.

Hab.—W. Australia (De Boulay); coll. Fry.

Lemidia labiata, n. sp.

Nigra, nitida, fronte, antennis, palpis, pedibus, elytris vittâ juxta suturam, maculâque apicali flavis.

Long. $1\frac{3}{4}$ lin.

Var. Brunnea, supra testacea thoracis disco, humero, elytrisque disco guttis duabus indeterminate fuscis.

Long. $2\frac{1}{4}$ lin.

Head with the eyes not very prominent, crown black, impunctate, shining. Thorax in the type black, constricted before and behind, sides rounded, narrowed behind. Elytra with distinct and deep punctures, which are thicker at the sides, with a vitta from the base to about two-thirds their length, indented on its outer margin, and a

Digitized by Google

small apical spot yellow, with a rosy tint. Legs entirely yellow.

The variety is larger, thorax with the disk only infuscate, the elytra nearly entirely pale, the punctuation not so distinct, and is probably not so matured an individual.

Hab.—Australia, Freemantle; coll. Gorham.

Lemidia plumbea, n. sp.

Elongata, subcylindrica, nigro-plumbea, fronte, palpis labialibus, femorum basi, tibiis, tarsisque rufis, elytris subnitidis, confuse crebre punctatis.

Long. $3\frac{3}{4}$ lin.

Leaden-black, elongate, thickly clothed with grey pile, thorax and head with erect setæ, antennæ and maxillary palpi fuscous, front of the head, labial palpi, base of the femora, tibiæ, and tarsi red, the apex of the hind tibiæ and their tarsi being pitchy. Sides of the thorax moderately rounded and narrowed behind, the constricted lines hardly apparent; disk irregularly punctured, the width equal to the head, length half as much more. Elytra thickly and irregularly punctured, widened behind, moderately convex. Underside black.

Hab.—S. Australia; coll. Fry.

Obs.—Though abnormally convex, and more pubescent than usual in this genus, and larger than any other known to me, there are no differences which would warrant its generic separation. The palpi, antennæ and tarsi are perfectly agreeable to those of *L. nitens*, and it is not very dissimilar to the species of the *subænea* and *pilosa* group.

ISOLEMIDIA, genus novum.

Type, *I. pulchella.*

Hab.—Americam australem, Amazoniâ.

Caput prothorace latiore, oculis magnis prominentibus, minute excavatis; antennis quasi *Lemidiæ*, clavâ triarticulatâ; palpis maxillaribus apice truncato, subfiliformibus, labialibus securiformi.

Pronotum subcylindricum, antice et postice constrictum, lateribus medio lobato-dilatatis.

Elytra, apice truncato (*pulchellæ*) vel integro.

Tarsis quinque-articulatis, articulo basali obsoleto, secundo articulum primum obtegente.

Digitized by Google

The present genus is very close to *Lemidia*, and those who think a genus so restricted in geographical range, as that appears to be in the Eastern hemisphere, can reappear in a longitude and latitude where conditions of life are so very different, will probably see no good reason for its separation. Yet so many insects have been referred to *Lemidia* which have no connection with it generically, that I am disinclined to add to the number even where the characters are very similar, from so improbable a habitat.

There is, moreover, a very different facies in the beautiful little Clerids, which I connect under a name designed to express their parallelism to the Australian type. The only specimens I have seen are in Mr. Fry's collection, and were collected by Mr. Bates, with the exception of one, *I. subtilis*, discovered by Mr. Fry at Rio, which is, however, doubtfully associated with them. The most obvious differences between these insects and *Lemidiæ* (apart from their very singular coloration) are the comparative largeness of the eyes, the more cylindrical and more deeply-constricted prothorax, the much less obvious and more atrophied basal joint of the tarsi, and, if I am not deceived, the truncate apex of the maxillary palpi.

Isolemidia pulchella, n. sp.

Elongata, sub-parallela, ferruginea, nitida, capite et prosterno fusco-piceis, elytris nigris, obsolete punctato striatis, apice rotundato-truncatis; basi, regione scutellari, maculâ juxta suturam et basin, fasciâque subapicali læte viridibus, lucidis; antennis (apice excepto) tibiisque viridibus, corpore supra et infra, pedibusque setis nonnullis vestitis.

Long. 3¼ lin.

Head wider than thorax; eyes large, very prominent, finely facetted, front hollowed between them; epistoma with an obscure red spot; mouth pitchy, maxillary palpi red, labial red, with the hatchet-shaped terminal joint greenish. Thorax longer than wide, a well-defined constricted line in front, and equally constricted but not so sharply behind, sides widened, rounded. Elytra shining black, the entire base narrowly, the space round the scutellum (which is black) a spot posterior to this, and a fascia about a third from the apex, of a beautiful light emerald green; the fascia externally shades into blue.

Digitized by Google

Legs red. Tibiæ greenish. Antennæ green, with the two apical joints brown.

Hab.—Ega, Amazon; "found clinging to slender dead twigs" (H. Bates); coll. Fry.

Isolemidia Batesi.

Elongata, elytris oblongis, nigra, nitida, elytris punctato-striatis maculâ minutâ scutellari, fasciâque latâ extus abbreviatâ læte viridi-cæruleis, apice ferrugineo, palpis pedibusque obscure olivaceis, antennis, femoribus, et tibiis posticis fuscis.

Long. 2¾ lin.

Head with the eyes much wider than the thorax (which is not so much widened at the sides as in the preceding species), front impressed but not much excavated. Thorax half as long again as wide, constricted before and behind (as in *pulchella*). Elytra at the base, of the width of the head, widened considerably to near the apex, which is rounded, more convex and shorter than *pulchella;* punctures and striæ obsolete, but the former distinct as black dots on the blue-green fascia, which takes the form of a transverse square spot, and is much larger in one of the two specimens than in the other, apex ferrugineous red (in the smaller specimen only narrowly so). Legs olivaceous, middle femora, posterior femora and tibiæ black.

Hab.—Amazon, village of S. Paulo (Bates); coll. Fry.

Isolemidia apicalis, n. sp.

Elongata, elytris oblongis, rufo-picea, nitida, occipite, thoracis linea dorsali et lateribus, femoribus posticis medio, elytris (apice excepto) et corpore toto subtus nigro-piceis; pedibus anticis fere totis, tibiis tarsisque posticis viridibus.

Long. 2½ lin.

Allied to the preceding, but of a more or less dilute pitchy-red. Form very nearly the same as in *Batesi*, puncturing of the elytra very obsolete; the latter are pitchy-black, with a very small, ill-defined, yellowish-green spot on the base near scutellum, the apex broadly pitchy-red.

Hab.—Ega, Amazon (Bates); coll. Fry.

Isolemidia? subtilis, n. sp.

Filiformis, nigro-picea, nitida, capitis fronte, antennis,

Digitized by Google

palpis, pedibus, elytrorum basi, margineque toto, et fasciâ medianâ flavis.

Long. 2 lin.

Head wider than thorax, equal to the elytra at their base, the crown pitchy, but the yellow of the front extends around the eyes. Thorax elongate, equally constricted before and behind, sides moderately widened and rounded. Elytra widened a very little to the apex, scarcely showing any trace of punctures or striæ; pitchy with their base, a middle fascia, and the apex yellow, the margin narrowly of the same colour.

Hab.—Rio Janeiro; captured by Mr. Fry.

Obs.—A delicately-formed insect reminding one of certain *Hydnoceræ*, e.g. *H. virescens*, described hereafter; nevertheless the antennæ, though very gradually thickened, have a three-jointed club.

HYDNOCERA, Newman.

Type, *H. pallipennis*, Say.

Hydnocera bella, Westw. G. & H. Cat. p. 1749. This is a *Lemidia* with very little doubt.

Hydnocera scabripennis, Gemm. G. & H. Cat. p. 1749. Cannot remain here; *Hydnocera* is essentially an American genus.

Hydnocera marginata, n. sp.

Pallide testacea elytrorum margine, suturâ pedibus externe, antennarum clavâ, scutello, abdomineque piceis, elytris postice angustatis, abbreviatis, valde punctatis, limbo externo juxta apicem minute serratis, apice recte truncato.

Long. 3 lin.

Head wide, crown smooth, shining, ferruginous; mandibles a little darker, mouth and palpi clear yellow-red; antennæ with the club, i. e. the last two joints, pitchy. Thorax red, the lateral margin alone pitchy in front, narrowed behind, sides widened just behind anterior constriction, disk uneven, shining. Elytra pale yellow, coarsely and irregularly punctured, the entire margin, apex, and suture narrowly pitchy, but not the base; humerus and scutellum pitchy; the elytra in this and the following species are very flat, their sides straight, contracted from the base to the apex, which is cut off nearly

Digitized by Google

straight. Legs pale, femora more or less margined and clouded with pitchy; tibiæ darker at their base, and partly margined.

Hab.—Aceytuna, Guatemala (O. Salvin); at an elevation of 5,100 feet.

Hydnocera Guatemalæ, n. sp.

Nigro-picea, nitida, ore, antennis, palpis, pedibusque flavis; elytris pallidis, suturâ antice, maculâ medianâ triangulari communi, humero, et apice piceis; thoracis margine antico et postico tenuissime albido-flavis.

Long. 2½ lin.

Head wide, crown shining, clothed with short depressed hairs; mouth and antennæ entirely pale. Thorax shining, irregularly punctured, widened below anterior constriction, narrowed behind, the front and hind margins pale testaceous. Elytra coarsely punctured, shining pale whitish-yellow; the humerus, a triangular spot on the suture (its angles scarcely reaching the margin), and an apical spot (round internally) with the suture itself in front black or pitchy; apex truncate, sutural and marginal angles serrate, legs entirely pale, body pitchy black.

Hab.—Guatemala (Salvin), alt. 5,000 feet.

Obs.—Allied to *H. pallipennis*, Say (*serrata*, Newm.), distinguished by the larger size, thorax with pale margins, coarser punctuation and form of markings.

Hydnocera flavifemorata, n. sp.

Nigro-cyanea, nitida, distincte punctulata; elytris nigro-piceis, maculâ basali fasciaque medianâ suturâ interruptâ albidis; pedibus nigro-piceis, femorum basi pallidis, ore cum antennarum basi testaceis.

Long. 3 lin.

Allied to *cincta*, Spin.; distinguished by the pale spot on base of elytra, larger size, and blue tint of head and thorax.

Hab.—Amazon (Bates); coll. Fry.

Hydnocera pallipes, n. sp.

Nigro-cyanea, nitida, capite thoraceque minute punctatis; elytris basi, maculâ medianâ pedibus (tibiis posticis nigris) testaceis.

Long. 3 lin.

Closely allied to preceding species, but with the legs

Digitized by Google

almost wholly pale, the four posterior tibiæ alone being dark at their base. The elytra have a bluish tint and are distinctly and evenly punctured; the shoulders and base broadly rusty-red, a central fascia red reaching the margin but interrupted by the suture; apex scarcely serrate; their whole surface clothed with yellow down.

Hab.—Amazon (Bates); coll. Fry.

Hydnocera rufithorax, n. sp.

Ferruginea, nitida, elytris (basi excepto, fasciâque medianâ albidâ interruptâ), femorum medio, tibiis, abdomineque nigro-piceis.

Long. 2 lin.

Allied to the preceding; the red head and thorax and smaller size will easily distinguish it.

Hab.—Amazon (Bates); coll. Fry.

Hydnocera virescens, n. sp.

Elongata, ferruginea, thorace, pedibus, elytrisque subvirescentibus; elytris apicem versus ampliatis obsolete striatis, impunctatis, nitidis, medio subfasciatis.

Long. 2½ lin.

This species and the one following resemble in form those of the genus *Isolemidia*, but the structure of the antennæ is that of typical *Hydnoceræ*. Eyes wide, prominent; thorax constricted equally before and behind, sides lobed. Elytra of the width of the head at the base, widened evenly and gradually to near the apex.

Legs clear, sea-green; antennæ greenish-yellow at the base.

Hab.—Rio Janeiro (Fry); Parana, coll. Gorham.

Hydnocera olivacea, n. sp.

Picea vel rufo-picea, nitida; elytris pedibusque viridi-olivaceis, illis maculâ parvâ basali, fasciâque obliquâ, nec suturam nec marginem attingente carmineo-rufis.

Long. 2¾ lin.

Head and underside dark pitchy-brown; thorax pitchy-red, disk with a double costa, subtuberculate, elongate, sides lobed; elytra shining, impunctate olive-green, with a round basal spot, and a fascia obliquely directed from near the margin to the suture pinkish-red.

Legs green.

Digitized by Google

Hab.—Parana; coll. Gorham.

Obs. A species reminding one of certain *Epiclines* of Chevrolat's section *Dereutes*.

Var. ? Olivacea, thorace subrufa, elytris basi juxta suturam, fasciaque obliquâ albidis.

Hab.—Parana; coll. Gorham.

EMMEPUS, Motschulsky.

Type, *E. arundinis*, Mots.

ELLIPOTOMA, Spinola.

Type, *E. tenuiformis*, Spin.

The antennæ, as Spinola observes, have but eight joints really distinct, and it appears probable to me that he was probably deceived as to the subdivisions of the fifth apparent joint, and that the genus ought to be characterized as having eight apparent, but really eleven, joints to the antennæ. The tarsi are probably also defectively described, but I have not seen the species in any collection.

ALLELIDEA, Waterhouse.

Type, *A. ctenostomoides*, Wat.

The elytra are serrate at the apex.

THEANO, Castelnau.

Type, *T. pusilla*, Cast.

The very small size,—half a line,—should cause this Columbian genus to be recognized. I have not seen it.

PAUPRIS, Sharp (Ent. Mag. 1877, p. 271).

Type, *P. aptera*, Sharp.

The *tout ensemble* of characters of this anomalous genus bring it, as I think, more into harmony with the Hydnocerides than with *Opilo* and its allies. The coarse granulation of the eyes is only of secondary importance; whereas the shortening of the elytra and strong difference in the palpi has its correlative here.

Digitized by Google

Digitized by Google

XIX. *On the variation of* Rhopalocerous *forms in South Africa.* By J. P. Mansel Weale, B.A., Oxon.

[Read July 4th, 1877.]

These notes must be prefaced by the remark that my knowledge of Entomology and Botany has been principally derived from personal study of South African forms in the field, with such assistance as I could procure from a limited library and correspondence. The statements made are for the most part statements of observed facts carefully studied on the spot, and illustrated by specimens entirely of my own collection and by drawings from nature. Whenever deductions are made I shall be careful to distinguish these, and will give the reasons upon which they are based.

Having travelled over a considerable portion of the eastern districts of the Cape Colony and the Free State, and having resided during several years in three distinct localities, viz., Port Elizabeth, Bedford, and near King Williamstown, I have had the advantage of personally noting the physical peculiarities of these districts in particular, and their general relation to the country adjoining.

If hitherto the course of study has been in my case discursive and superficial rather than special, I feel that in hereafter thoroughly working out and investigating any group I shall possess a wider grasp of the intercalating conditions modifying the units which compose it, than can an ex-African specialist, who has been unable to note the difficult and complicated relations between the climate, soil, flora and insect fauna of South Africa.

I have been struck, in some cases, with the close interdependence between variations of insects and variations in the flora, which I believe to be due largely to modifications of the latter by climate and soil. For instance, *Acacia horrida* has a very extensive range, being found along the watercourses of the most arid inland districts, and also being spread widely over the moister grass lands of the coast. Of all native shrubs it is probably the richest habitat of insect life of almost all the orders. It varies not merely in general appearance and growth, but also in

Digitized by Google

the size, luxuriance and form of the foliage; in the length, colour and number of spines; being in some localities nearly spineless, while in other localities the spines often measure over 7 inches in length. The size of the glands on the petioles, which are very attractive to some insects on account of their secretions, also varies. The bark differs in texture and colour, being sometimes pale grey, sometimes almost black, and generally a rich raw-sienna colour; sometimes smooth, and at other times extremely rough. The number and kinds of insects, which avail themselves of protective resemblances in like manner vary, while the many-coloured and brilliant *Cetoniidæ* and allied beetles, which frequent the blossoms, differ in the different districts; the same is also noticeable in the *Buprestidæ*.

In some districts allied forms supplant partially this plant, and have been described as specifically distinct; this is especially noticeable in the neighbourhood of the Kei River. Various species of *Loranthaceæ* in different districts are parasitic on this plant, and their flowers are highly attractive to some insects, at times, when the Acacia itself is out of blossom.

Many of the *Capparideæ* in like manner replace each other, and I believe the larvæ of *Eronia Cleodora* and some *Callosunes*, the species of which are very variable, feed on different forms.

I have noticed that in very dry seasons the larvæ of some Lepidoptera, which usually feed on particular plants, devour indiscriminately the leaves of plants belonging to most dissimilar orders apparently without any bad effects. Thus, in February of this year, I noticed a conspicuous heterocerous caterpillar which usually feeds on *Sideroxylon inerme*, devouring the foliage of *Schotia speciosa*, *Capparis Zeyheri*, *Acacia horrida*, and of a species of *Rhus*. Some very widely-ranging species are noticeable for this peculiarity, and in dry seasons this adaptability must be a powerful aid to them in the struggle for existence. The larva of *Danais Chrysippus* devours the foliage of most of the *Asclepiadeæ*. Those of *Pyrameis Cardui* live on several *Urticaceæ*; and although undoubtedly a feeder on native plants, I have hitherto found the larvæ of *Ismene florestan* only on the foliage of *Robinia pseud-acacia*, an American tree.

Roughly speaking, the flora of the Cape Colony may at present be divided as follows:—

(1) The flora of the western districts; (2) the flora of

Digitized by Google

the eastern districts; (3) the flora of the northern inland districts; and (4) the immigrant sub-tropical coast flora. All these divisions intrude on each other, and since the republication of Harvey's "Genera" many plants noted there as western have been found to extend into the east, while in like manner many noted as Natalian are found far to the southward of Kafirland proper, between the mountain chain and the seaboard.

Another rough division, made generally by the farming population, is important as affecting insect life. The coast land and the mountain tops consist principally of what is known as the *sour grass veld* (the grasses abounding in woody fibre and somewhat innutritious); intermediate between this and the *sweet karroo or bush veld* (characterized by a dwarf scrub scarce in grasses) is the *gebrokte or sweet grass veld*, in which dwarf bushes and grasses are very equally intermixed. This latter is characterized by no definite district, occupying sometimes parts adjoining the coast and sometimes parts inland; in the one instance being visited by a slightly more and in the other by a slightly less abundant rainfall than the adjoining country. Thus plants and insects allied to those chiefly peculiar to the seaboard are occasionally to be found inland, as it were on little islands or broken promontories, and generally in the neighbourhood of some spur of the mountain ranges. I have no doubt that in wet seasons with southerly winds these localities are often peopled by migrants from the seaboard, as at such times I have noticed birds and insects migrating—seabirds being blown far inland.

These general statements cannot be as yet thoroughly demonstrated, but it is curious to note how on the seaboard plants may be found in the river valleys either of the same species or of forms allied to those of the inner districts, while they are completely absent in the higher ground adjoining, the plants of which may be described as sub-tropical. Sometimes these differences are so slight as to be only distinguishable by a more luxuriant growth or by the different texture and flavour of the foliage—a difference sufficient to render them distasteful and noxious to domesticated animals. *Portulacaria Afra* (Spekboom) and some species of *Euclea*, greedily devoured in the drier districts inland, appear even in dry seasons comparatively distasteful to sheep on the coast. The introduced prickly pear (*Opuntia vulgaris*), which forms large thickets in

Digitized by Google

some districts, differs in growth and in the number of prickles in some localities, and is said to have assumed distinct varieties, being sometimes almost free from prickles, and called by the farmers the *Kaalblad*, or naked leaf.

I believe that more extensive researches will show that the whole of the south-eastern seaboard is gradually being upraised (a conclusion already confirmed by some South African geologists), and that this upheaval has been accompanied on the seaboard by a moister climate suitable to the immigrant flora and insect fauna of sub-tropical South Africa. Hence it is that the few existing arboreal forms of plants are only to be found in the patches of forest clothing, the southward aspect of the mountains, and the intervening tracts between them and the Indian Ocean.

In the deeper valleys, which represent the river beds of this tract, the plants show distinct relationships to those of the interior plains; in some instances, this is doubtless due to the transportation of seeds during floods, and partially to the great heat and aridity of these low-lying lands; but these conditions are absent in several cases where the rivers have very short courses, and therefore the affinity of these local floras appears to me to point out that they are survivals of the original inland flora, whose area has been gradually contracted.

So far as man is concerned, there can be little doubt that the *Abantu*, or dark-coloured races (known commonly as Kafir and Fingo) have driven the lighter races, or *Koi-koin* (Hottentots and Bushmen) to the south, and curiously enough the traces of these last for the most part survive only in the names of the rivers, most of which are still known by Bushman names.

The Kafir tribes, too, being dependent on cattle and sorghum for their sustenance, naturally avoided the interior plains, and some of them show very distinctly the fusion of the two races, not merely in their features, but also in their language.

Without these preliminary remarks, it appears to me difficult to understand the distribution and variation of South African insect forms.

The great similarity of conditions (omitting those distinctions already alluded to); the absence of any large rivers or of very lofty mountain chains (the average height being less than 4,000 feet); of deep inlets of the

Digitized by Google

sea, and of freshwater lakes forming impassable barriers; the generally graduated and but little differentiated peculiarities of climate, are highly favourable to the inroads of variable forms; such as my friend, Mr. Trimen, has shown, in the case of *Papilio Merope*, to be distinctly now in process of creation.

The series of *Papilio* (*Merope*) *Cenea*, Trim., now exhibited,—49 in number, consisting of 18 ♂s and 31 ♀s,—shows insects raised from larvæ, and insects collected in every instance but one from a small gulley or *kloof*, as it is colonially termed, isolated on an open grassy country, and separated by at least four miles from any other bush or forest.

Of the ♀s, six belong to the *Trophonius* form; three to *Hippocoon;* one slightly intermediate between *Hippocoon* and *Cenea*, but nearer to *Cenea;* and one coloured somewhat like *Cenea*, but showing approximations to *Trophonius* and *Hippocoon;* the remaining twenty are entirely or nearly of the *Cenea* form, with white spots on the fore wing, in imitation of the prevailing variety of *Amauris Echeria.*

Of the specimens exhibited, five ♀s were raised from larvæ. Among these, one *Cenea* and two *Trophonius* forms are the smallest I have seen, the *Cenea* measuring less across the wings than do many *A. Echerias.* This diminished size is probably due to the insects having been reared in confinement, but it most strikingly illustrates the imitation. I had hoped to have brought some living specimens of the pupæ to England, but shortly after my former paper was written, I left my farm and went to reside in another locality, where *Merope* was peculiarly scarce, and a hurried search made on the trees, whence my specimens were obtained, failed, probably on account of the dryness of the past year, in discovering any.

The *Hippocoon* form is by far the rarest (*vide* Trans. Ent. Soc., 1874), yet I believe that I once saw a specimen of *Amauris Niavius* in the neighbourhood, although its capture in Kafirland has not hitherto been recorded. The *Trophonius* form appears in slightly larger proportions than the last, and I attribute its scarcity to the fact that *Danais Chrysippus* frequents thick bush much less frequently than *Amauris Echeria*, which is essentially a sylvan butterfly. The two specimens reared by me from their reduced size strikingly illustrate their likeness to *D. Chrysippus.*

Digitized by Google

It has been objected by some persons that I have not seen the *Merope* ♀ depositing the eggs from which my specimens were reared. I may remark that a careful search of my kloof failed in discovering more than a single tree of *Toddalia* (*vepris*) *lanceolata*. I must also own that the objection appears to me to be of rather a frivolous nature, coming as it does from those who have been too ready to separate into species insects but slightly different from each other, and often from the inspection of single specimens in collections. All the *Papilios* with which I am acquainted in a state of nature deposit their eggs singly—each generally on a separate leaf—and it would be almost impossible to vouch for the parents of the individual caterpillars, especially when the peculiar habits of *Merope* ♀, as described in my former paper, are taken into account. The objectors appear to plead for "a long day" ere the sentence of death is executed on their species, and their demand appears almost as reasonable as if they required that a lord chancellor or an archbishop should vouch for the legitimacy of birth.

The causes of migrations yet require considerable investigation, but I have often noticed that ♂s of some butterflies and of other insects appear to migrate farther than the ♀s—contrary to what one would suppose. I never met with *Merope* ♀ at Bedford, but I believe I more than once saw a ♂, and *Harma Eupithes* supposed to be the ♂ of *H. Alcimeda* migrates in considerable quantities. The male locusts often descend in large numbers to the seaboard and sometimes pass out to sea, but the ♀s rarely enter the Zuurveld, as it is called. Although I never remember meeting with *Toddalia* (*vepris*) *lanceolata*, the food plant of *Merope*, at Bedford, I think it is probably found there, as are some of its close allies; and so far as *P. Nireus* and *Demoleus* are concerned, their larvæ appear to me to feed freely on almost any of the *Xanthoxylaceæ*, *Aurantiaceæ*, as well as on some *Umbelliferæ*—*Clausena inæqualis* being often stripped of its foliage by larvæ of *Nireus*. A more important point would be the apparent absence of *Amauris Echeria* from the Bedford forest. I captured, however, a *Papilio Echerioides* ♂, and found *Nymphalis Xiphares* (*Thyestes* ♂), both ♂ and ♀, common there, as also in Kaffraria, an examination of the ♀ of which shows an evident tendency to the coloration of *A. Echeria*.

The next series of insects exhibited are those of *Acræa*

Digitized by Google

Esebria, Hew., and I may remark that every one of the forms (not specimens) shown, has been raised by me from larvæ taken at random from one plant of a species of *Fleurya* (*Urticaceæ*): (1) markings in both wings white; (2) markings in fore wings white, in hind wings yellow; (3) markings in both wings yellow; (4) markings in fore wings white, in hind wings brick-red; (5) markings in fore wings yellow, in hind wings brick-red.

Some larvæ I confined in a dark box, and found that the coloration of the pupæ (usually white with thin black and orange markings) was materially altered and darkened, so as closely to resemble those of *Acræa Horta*, but the imagines were as varied in colour as those raised under ordinary daylight. This darkening of colour I have found to be very common under the same circumstances in pupæ belonging to different families of butterflies. Both the larvæ and pupæ of those *Acræas* known to me are found in conspicuous places without any attempt at concealment.

I will next refer to a series of *Junonias* which exhibits so close a gradation between the two extreme forms, and a slight tendency towards another form, as to lead me to the belief that no actual separation exists between at least the two in nature. These variations are not confined to the upper surface, and extend to the colour, markings, and even form of both wings.

I believe entomologists have generally separated the two as *Junonia Pelasgis* and *J. Archesia*. As I am at present unacquainted with the larvæ I refrain from expressing a decisive opinion, and can only refer to the evidence afforded by the specimens exhibited.

Those which display in a marked manner the light-coloured transverse bands of *Pelasgis* are for the most part from the seacoast or thereabouts, but not invariably so, while the intermediate forms allied to *Pelasgis*, though common inland, are also met with on the coast.

I may remark, that *Archesia* is in the neighbourhood of Bedford a commoner insect than *Pelasgis*, though the latter is by no means scarce, and is usually seen more frequently in a wet season with southerly winds. On the coast *Pelasgis* is, I think, distributed in somewhat greater abundance than *Archesia*. The relative numbers of the two species vary in different years.

With respect to *Archesia* itself I would particularly note the purple sheen very apparent on Kaffrarian speci-

Digitized by Google

mens, the nervules dividing the transverse band of hind wing especially exhibiting it, while it is altogether absent from Bedford examples. The markings extending from the base of discoidal cell to the apex of fore wing, in their bluer hue, together with the generally darker ground of the upper surface of the wings, and a distinctly bronzy sheen on the under surface, appear to me to show a tendency in these Kaffrarian specimens to vary in the direction of *Junonia Amestris*, Trimen, although the line of demarcation shows material differences in form and colour. I have, however, seen specimens in other collections, collected over a wider area than those in my possession, which appeared to me to bridge over this gulf; and it is curious to note that while Mr. Trimen, in his Rhop. Afr. Aust., notes the close relationship of these last species, I found by correspondence, about the year 1868, that he was disposed to doubt the close alliance between *J. Pelasgis* and *Archesia*. Subsequent correspondence with that able observer, Mrs. M. E. Barber, whose observations confirm my views, and an examination of a long series of these insects have, I believe, led Mr. Trimen to a somewhat similar opinion.

In fact, a hurried examination of a long series of *Junonias* in the South African Museum in Cape Town induces me to suspect that a separation into distinct species of some forms is, at present, in the absence of complete knowledge of the earlier stages and habits of these insects, likely to result in vexation of mind and confusion of words and their meanings.

If collectors, instead of hunting with a hungry ambition for new species, were systematically to collect extensive series of well-known forms over large areas, their researches would result in most valuable knowledge as to the external conditions which modify organic forms. The disturbing conditions which large agricultural enterprises must introduce are for the most part absent in some of the wider continental areas of South Africa, South America and Australia, and it is from such localities that we may anticipate great results.

It appears to me that the word "species" as applied to insects and plants, which produce many offspring at a time, in the presence of the extraordinary discoveries of late years had better, so far as any definite meaning is implied by it, remain in abeyance, or at all events be used only in a provisional manner as an uncertain distinction

Digitized by Google

of apparently important differences. The multiplication of species and their barbarous names involves a considerable waste of valuable time, and implies in some cases labour lost in an ignis fatuus search for innumerable synonyms.

In some respects it retards biological progress, for many persons who would gladly follow natural history pursuits, are deterred by the formidable bibliographical folios, which it is too often necessary to consult.

The next specimens exhibited afford an illustration of some of these remarks.

In the "Saturday Review" for 16th June, 1877, I find the following remarks in reference to Mr. Darwin's last work: "No absolute definition of species has ever been found possible. What is called fixity of species is the result of the continuity of external conditions. So long as the biological conditions remain unchanged, there is no reason why a species should vary."

Yet in the face of these remarks I now present to the Society one of the most curious cases of variation I have yet met with.

In Mr. Trimen's Rhop. Afr. Aust., Vol. I., is described *Anthocharis* (*Callosune*) *Keiskamma*, Trim., a species there noticed as not improbably capable of being classed as a sub-species of *C. Evarne*. Both of these butterflies I have often seen in the neighbourhood of the Keiskamma River, the former being especially abundant, in fact, the whole valley of the Keiskamma is peculiarly prolific in *Callosunes*. During the last three years I have been staying about three miles from King Williamstown in the valley of the Yellowwoods, and I was much struck by the abundance of *C. Keiskamma* near a small group of bushes from January to May, 1876, especially so, as I had not met with the insect in the neighbourhood before. The spot in question is about fifteen miles in a direct line from the Keiskamma with high ground intervening. I captured that season about twenty or thirty of both sexes, and wishing to discover the food plant I noticed that the butterflies especially frequented a bush, which I had not before noticed. This proved to be *Cadaba Natalensis* (*Capparideæ*), not hitherto, I believe, reported from the South of Natal. The ♀s deposited their small, fluted, orange-coloured eggs singly on the summit of the flower buds. A chrysalis was also found on one of the outer branches of a bright-green colour, and it proved to be that

Digitized by Google

of *C. Keiskamma*. The larva, when first hatched, is of a bright-orange colour, and penetrates the bud, where it passes its first stage. It afterwards assumes a dull bluish-green colour with lateral stripes of a paler colour, these assimilate it to the pellucid margins of the small leaves of the plant, whose general colour it resembles. The younger caterpillars of *Eronia Cleodora* closely resemble the mature larva of *C. Keiskamma*, but are more brightly coloured in harmony with the foliage of *Capparis Zeyheri*, one of its food plants. Most of my larvæ of *Keiskamma* were procured by beating, as it was most difficult to detect them on the shrub. In raising chrysalids I was particularly struck by the variations of their colour under different conditions. These variations were not, however, followed by any marked differences in the colour and form of the imagines.

About this time I regret to say that I gave away most of my specimens of this species to a Mr. Bailey, of Port Elizabeth, under the impression that I could at any time replace them, and being engaged in some other work I neglected to collect this species until the end of 1876. To my great surprise I found every insect captured on the bush proved to be not *C. Keiskamma* but *C. Evarne*, which I had also not noted in the neighbourhood before. Owing to the dryness of the season, these, however, were scarce, and it was some time before I had an opportunity of watching the ♀s laying their eggs or of collecting the larvæ. By daily watching the bush, I had before leaving in April last succeeded in collecting several, which were exactly similar to the larvæ obtained in the previous autumn. I also saw the ♀ *Evarne* laying her eggs in precisely the same manner as did the ♀ *Keiskamma*. The eggs in like manner did not differ; and not merely were the pupæ the same in shape and markings, but they presented the same liability to vary in colour as did those of *C. Keiskamma*.

Up to the end of April last I never saw another specimen of *C. Keiskamma*, although the specimens of *Evarne* round the bush in question were numerous. I think this a most curious case, because, although the two insects closely resemble each other, the differences relate not merely to the colour of both wings on both surfaces and in both sexes, but also to form.

Considering how closely many of the so-called species of this group resemble each other, and how extremely

Digitized by Google

variable are even the forms collected in a single locality, I think that an instance such as this should make naturalists pause before multiplying its nomenclature. Although I am disposed to think that more careful observation will show that this is not an isolated instance in the *Pierina* group, it certainly would seem contradictory to the axiom "Natura non facit saltum."

I may remark that individuals of both forms vary much, but in none of the instances collected by me do they show any tendency to vary in the direction of the other form.

From what I have noticed in some other *Pieridæ* I am inclined to think that the yellow coloration to which some species are peculiarly subject depends in some way or other on the dryness of the season. Specimens of *P. Severina* and *Mesentina* (♀s) collected in dry seasons in moist localities or in dry districts are generally deeply coloured.

With reference to the changes in the colour of pupæ I believe a very wide field of research is open, and with the improved modes of microscopical examination under the spectroscope important revelations on the subject of variation will be discovered.

I here give the results of some very rude experiments on this subject.

Most of the specimens were reared in glass test tubes exposed on coloured cards, in which they were partially enveloped. They were constantly supplied with as little food as possible, in order that their full exposure to the colour should not be interfered with.

Pupæ of *C. Keiskamma.*

(1.) On dead leaves away from light. Dark brown.
(2.) On stem and on vermilion cards. Pale ochreous.
(3.) On vermilion card. Pale bluish-green.
(4.) Exposed on bush in nature and on yellow-gamboge cards. Bright green.
(5.) On glass tumbler. Pale yellowish-green.
(6.) On green (cobalt and gamboge). Ochreous.
(7.) On cobalt-blue. Greenish-white.

On a white surface, pupæ of *Eronia Cleodora* became so pale coloured as to be almost translucent, the marks on the ventral aspect of the abdomen being almost obliterated, and the bright yellow-green colour usually predominant almost invisible. Pupæ of *Danais Chrysippus* in a state of nature are most variable in colour.

Digitized by Google

Digitized by Google

XX. *Vivarium Notes on some common* Coleoptera. By J. W. Slater.

[Read 5th September, 1877.]

It may, perhaps, seem somewhat presumptuous to suppose that anything of value can be learnt either concerning or from such very common insects as those on which I am about to speak. Still some, at least, of the facts I have observed may have escaped notice; and the safer course, therefore, is to lay them before the Society.

The first species to which I have to refer is the common rose-beetle (*Cetonia aurata*). I found one of these insects as early as March 30th, and placed it in my vivarium. As suitable flowers were not at hand I gave it slices of apple, which, I may remark, may be used for the food of very many species of beetles in captivity. It ate the fruit very heartily, making long straight double furrows with its mandibles, and licking up the juice with eagerness. As soon as I could procure suitable flowers, such as hawthorn-blossom, and, later in the season, roses and elder-blossom, I placed these in the vivarium, when the apples were at once neglected. The *Cetonia* went straight to the flowers, erecting its antennæ, and opening the leaflets of the club, and proceeded to eat the pollen with greediness. It seized the stamens sometimes with its fore-pair of legs, and, by the united play of the mandibles, maxillæ and palpi, brought the pollen to its mouth. I never observed it eat the petals, nor did it ever seem to search for honey. As the season got later two more specimens of the species were placed in the vivarium, but I could perceive not the slightest difference in their actions. I never saw them use their antennæ as organs of touch. When food was placed near them, these appendages were flourished over it rather than applied to it, thus decidedly supporting the view that they are organs of scent. The beetles took no notice whatever of loud noises.

After being fed, especially on a bright day, they used to fly about within the vivarium, their movements being rapid but clumsy, and accompanied with a very loud humming. The excrement of these insects is semi-fluid, of a

Digitized by Google

blackish-brown colour, and is ejected to the distance of about 1½ inch.

Though more lively on a bright day than in cloudy weather, they often seemed annoyed by the direct light of the sun, and would hide under leaves, flowers and even under slices of apple. Occasionally I have seen them moving about after sunset. At first, when captured, they were very shy, and if touched used to counterfeit death, but in course of time they became, to a certain degree, tame, and ceased to show any alarm if placed upon a fresh slice of apple, or if raised to their feet when they had fallen upon their backs. In shamming death, they generally assumed the uncouth attitude of the dung-beetles when alarmed, but sometimes they folded their legs up beneath the body, as is done by a *Byrrhus* when touched. Whether there was any different meaning in these two attitudes I have not been able to perceive. Indeed, concerning this simulation of death, and the purposes which it serves, we have still something to learn. We know that it is a stratagem common to certain *Coleoptera* and to spiders,—that it is the more resorted to, the smaller are the locomotive powers of the species,—and that its object must be the escape from enemies. But against what enemies can it serve as a safeguard? Many destroyers of insects prey upon the living and the dead quite indiscriminately, as, for instance, moles, hedgehogs, rats, mice and birds. A *Byrrhus*, indeed, when shamming death, might very easily be mistaken by predatory creatures for a pebble or a small clot of dirt. But a *Geotrupes*, with its legs stuck stiffly out, at once proclaims its organic and animal nature to all comers.

Kirby and Spence, indeed, maintain that rooks will not prey upon dead beetles, and that the *Geotrupes* may hence often escape their attentions by simulating death. This will seem *à priori* improbable if we consider that birds of the crow tribe are particularly given to preying upon dead animal matter. But in addition to the mere improbability, I have met with one direct instance to the contrary. I have seen a dead *Geotrupes* lying on the ground, have satisfied myself that it was actually dead, have noticed afterwards some rooks busy about the place, and have subsequently found the remains of the *Geotrupes* pecked to pieces. I place the higher value upon this instance as the rooks were not in captivity, and thus no one can urge that their natural habits had been modified.

Digitized by Google

Several specimens of *Carabus violaceus* and *C. monilis* were also in the vivarium. Contrary to what might be supposed, they also fed greedily upon pieces of apple, into which they dug deep holes with their mandibles. But the moment a small earth-worm was placed in the vivarium the apple was abandoned, and the worm devoured. I should be inclined to think that the genus *Carabus* is omnivorous. On the other hand, I have never been able to induce a *Cicindela* to take any vegetable food.

The "long-horns" do not readily accommodate themselves to a life of captivity. On the 4th of June this year I found *Callidium violaceum* in great abundance near Aylesbury. If so disposed I could easily have taken fifty or sixty upon a fir-wood railing about 150 yards in length. I put several of them in my vivarium along with some fir-wood, whose resinous juices they might imbibe, and some half-decayed willow-wood in which they might deposit eggs. They took no notice of either, but scampered incessantly about till they perished from sheer exhaustion. *Toxotus meridianus* I found to be similarly impatient of captivity. This insect seems to have a remarkable power of resisting the fumes of prussic acid. One of them placed in a killing-box well charged with potassium cyanide, and in which a great variety of insects succumbed immediately or within a few minutes of being introduced, survived as long as did another specimen in the vivarium.

The *Telephori* cannot be studied in captivity, on account of a similarly restless disposition.

These insects have long been known as carnivorous, but I am not aware whether it is on record that they are most diligent devourers of plant-lice. During the months of June and July this year nettles were infested with aphides to a remarkable extent, and it was difficult to turn up two nettle-leaves without finding a *Telephorus* of one or other species busy at work upon the depredators. In this respect I should think that they are more serviceable to the farmer and gardener than the lady-birds, being more voracious, more active, and, on the average, more numerous.

Digitized by Google

Digitized by Google

XXI. *Note on* Mygale stridulans. By Prof. James Wood-Mason.

[Read 5th September, 1877.]

Until Westring had placed on record (in "Naturhist. Tidshrift," vol. iv. 1842—43, p. 349; ii. 1846—49, p. 342; et "Araneæ Suecicæ," p. 184) his interesting discovery that the males of several species of *Theridion* have the power of making stridulating sounds, no single member of the great class *Arachnida* was known in which stridulating organs are developed. In 1876, I brought to notice (in Proc. As. Soc. Beng. and Ann. and Mag. Nat. Hist.), and ascertained the position and described the structure of the apparatus in, the great stridulating *Mygale* of Assam, discovered some years previously by Mr. S. E. Peal, who has furnished the following interesting account of the circumstances under which the discovery was made, and the accompanying spirited sketch of the animal in the attitude it assumes when stridulating: "The noise made is both peculiar and loud; it resembles that made by pouring out small shot on to a plate from a height of a few inches, or, better still, by drawing the back of a knife along the edge of a strong comb. The stridulation is very distinct, and has a ring about it which I do not notice in the *Orthoptera*, wherein it more closely resembles a whistling sound. It is now some six years since I first heard it, and under the following circumstances: some Assamese were cutting out an old bamboo-clump, the ground under which was dry and full of decayed roots and of holes; white ants had made a nest there, and I collected several 'queens.' While attending to these, with my back to the clump, at a distance of some four or five feet, I suddenly heard this peculiar noise, and, turning, saw the man who was hoeing the mound making futile blows with his hoe at a huge black spider that kept up this curious sound; but, the ground fortunately being uneven, none of the blows took effect, and I soon secured the prize. On reaching the bungalow, I undid the cloth in which it had hastily been secured, beneath an inverted tea-sieve, to avoid the possibility of escape. On stirring the cloth the spider ran out, whereupon my cat (which had arrived upon the scene while the spider was still hidden amidst the folds of the cloth, and had walked round

Digitized by Google

the sieve, smelling at it) pounced forward, possibly mistaking the prisoner for a mouse; but the spider, instead of retreating, ran round and round inside its prison, following the movements of the cat and stridulating louder than ever. When thus roused, the spider usually rested on the four posterior legs, raising the other four and shaking them in the air, with the thorax thrown up almost at right angles to the abdomen and the cheliceræ in rapid motion—assumed, in fact, quite a threatening attitude. The cat was much excited, and, had the spider been free, would probably have seized it, while the latter would equally probably have resented an attack by fastening on the former's muzzle. I was so taken by the whole affair that I did not kill the spider till the following night, and thus had many opportunities of verifying the foregoing observations."

The sound-producing apparatus in *Mygale stridulans* has been found to consist of a *comb*, composed of a number of highly elastic and indurated club-shaped chitinous rods arranged close together comb-like on the inner face of the basal joint of the palps, and of a *scraper* formed by an irregular row of sharp erect spines on the outer surface of the penultimate joint of the cheliceræ; and to be equally well-developed in the two sexes, the first specimen met with by Mr. Peal, indeed, having been a gigantic female.

In Westring's spiders the apparatus consists "of a serrated ridge at the base of the abdomen, against which the hard hinder part of the thorax is rubbed, and of this structure not a trace could be detected in the females." From the analogy of the *Orthoptera* and *Homoptera*, we may, with Mr. Darwin and Professor Westring, "feel almost sure that the stridulation" made by these spiders "serves either to call or to excite the female"; and if the sounds serve this purpose in the *Mygale* also, they must serve as a *mutual* call, the apparatus being present in both sexes; but it seems probable, from Mr. Peal's observations, that they are also emitted by the spider in self-defence—to render itself terrible in the eyes of its enemies, or, it may be, from fear; perhaps, also, they are serviceable to the animal for terrifying its prey; and, during its nocturnal rambles in quest of food, for warning the creatures that prey upon it of its dangerous and deadly nature, as I have read suggested with regard to the porcupines (*Hystrix* and *Atherura*) and, I believe, also respecting the rattlesnakes, in all of which the rattle is equally well-developed in the two sexes.

Digitized by Google

XXII. *Descriptions of new genera and of uncharacterized species of* Halticinæ. By Joseph S. Baly, F.L.S.

[Read Nov. 7th, 1877.]

List of Species.

Arsipoda fulvipes	Australia.
„ mærens	Mysol.
„ Wallacei	New Guinea.
Pseudodera orientalis	Bengal.
Clitea (n. g.) picta	India.
Systena ornata	Jamaica.
„ Deyrollei	Brazil.
„ cæruleata	Amazons.
Phygasia limbata	Lake N'Gami.
Longitarsus concinnus	Mexico.
„ Buckleyi	Ecuador.
„ Fryellus	Brazil.
„ Wallacei	Celebes.
„ capensis	Cape of Good Hope.
Docema collaris	Western Australia.
Apræa (n. g.) Jansoni	Jamaica.
Aphthona chinensis	China.
„ crassicornis	Jamaica.
„ Pilatei	Mexico.
„ Deyrollei	„
„ diversa	„
„ verticalis	Brazil.
„ nigro-cyanea	„
„ fulvipes	Pará.
„ amazona	„
Phyllotreta Jamaicaensis	Jamaica.
„ malayana	Celebes.
„ Downesi	Bombay.
Chætocnema divergens	Campeche.
„ gravida	Mexico.
„ Sallei	„
„ pallidicornis	Jamaica.
„ Steinheili	Columbia.
„ separata	Bogota.
„ labiata	Columbia.
„ Haroldi	Bogota.
„ amazona	Amazons.
„ braziliensis	Brazil.
„ Blanchardi	Chili.
„ rugiceps	Madagascar.
„ Ellisii	„
„ parvula	Ceylon.
„ basalis	India.
„ Westwoodi	Batchian.

Digitized by Google

Chætocnema	nitens	Batchian.
„	malayana	Malay Archipelago.
„	Wilsoni	South Australia.
„	propinqua	„ „
„	Waterhousei	Western Australia.
„	laticeps	„ „
„	laticollis	„ „
„	brevicornis	„ „
Xenidea	Wallacei	Sulu Islands.
„	purpureipennis	New Guinea.
Euplectroscelis	Deyrollei	Brazil.
„	tibialis	„
„	bimaculata	„
„	placida	„
„	nigripennis	Amazons.
„	sordida	„
Megistops	ornatus	„
„	pretiosus	Venezuela.

Genus ARSIPODA, Erichs.

Arsipoda fulvipes.

Late ovata, valde convexa, nigra, nitida, palpis antennisque flavis, his extrorsum nigro-piceis; subtus picea, pedibus abdomineque fulvis; thorace tenuissime punctato, basi utrinque longitudinaliter impresso; elytris distincte punctato-striatis, interspatiis planis.

Long. 2 lin. *Hab.*—Australia, Rockhampton.

Head trigonate, not longer than broad; vertex and front smooth, impunctate, impressed on either side by a deep flexuose groove, which, running along the upper and inner border of the eye, curves obliquely inwards to meet its fellow at the apex of the carina; encarpæ linear, oblique; carina oblong, the sutural lines between it and the encarpæ entirely obsolete; antennæ about half the length of the body, five lower joints yellow, the rest nigro-piceous. Thorax nearly three times as broad as long; sides straight, converging from base to apex, anterior angles obliquely truncate, thickened, the outer edge produced laterally into a short, acute tooth; basal margin bisinuate on either side, the medial lobe very obtusely rounded; upper surface very finely punctured, impressed on either side at the base with a curved perpendicular groove. Elytra broader than the thorax, broadly oblong-ovate, convex, finely but distinctly punctate-striate, the punctures rather coarser on the sides. Hinder tibia longer than the femur, only slightly recurved, its outer surface grooved for nearly its whole length.

Digitized by Google

Arsipoda mœrens.

Late ovata, convexa, nigra, nitida, tarsis posticis, pedibus anticis quatuor antennisque sordide fulvis, his apice piceis; thorace tenuiter punctato, utrinque basi obsolete impresso; elytris regulariter punctato-striatis, punctis apicem versus tenuiter impressis; interspatiis planis, minute sed distincte punctatis.

Var. A. Abdominis apice piceo.

Long. $2\frac{3}{4}$ lin. *Hab.*—Mysol: var. A. New Guinea (Dorey).

Head trigonate, not longer than broad; vertex nearly impunctate, very minutely rugulose; front impressed on either side with a very deep groove, which, extending along the upper and inner margin of the eyes, curves abruptly just before reaching the middle of the latter, and extending directly inwards to join its fellow immediately above the apex of the carina; encarpæ well-defined, transverse, narrow, elongate, separated by the apex of the carina; the latter compressed anteriorly, its upper two-thirds flattened, narrowly wedge-shaped, its apex truncate; antennæ about half the length of the body, filiform, the three outer joints fuscous. Thorax three times as broad as long; sides nearly straight and slightly converging from the base to the middle, thence slightly rounded and more quickly converging to the apex, anterior angles thickened, obtuse; basal margin sinuate on either side near the medial lobe, the latter obtusely truncate; upper surface finely punctured, impressed on either side at the base with an ill-defined, shallow fovea. Elytra rather broader than the thorax, very slightly attenuated towards the apex, convex, regularly punctate-striate, the striæ rather strongly punctured before the middle, much more finely so towards the apex; interspaces finely punctured. Hinder thighs strongly thickened; hinder tibiæ slightly incurved, the outer surface bicanaliculate. Apical segment of abdomen trilobate, the middle lobe longitudinally grooved.

The present and the following species differ from the typical form of *Arsipoda* in having the hinder tibiæ less excurved at the base.

Arsipoda Wallacei.

Late ovata, convexa, nitida, subtus pallide picea, abdomine pedibusque fulvis, femoribus tibiisque posticis nigro-piceis; supra nigra, antennis fulvis; thorace sub-

Digitized by Google

crebre punctato, utrinque basi leviter impresso; elytris regulariter punctato-striatis, interspatiis planis, tenuiter punctatis.

Long. 3¼ lin. *Hab.*—New Guinea.

Head trigonate, not longer than broad; vertex irregularly punctured; front impressed on either side by a deep groove, which, running along the upper and inner border of the eye, curves inwardly just before reaching the middle of the latter, and runs almost directly inwards to the apex of the carina; encarpæ well-defined, oblique, oblong, separated from each other by the extreme apex of the carina; the latter compressed and strongly raised anteriorly, dilated and flattened towards the apex, its upper half trapezoidal; antennæ rather more than half the length of the body, filiform, fulvous, slightly stained with fuscous towards the apex. Thorax three times as broad as long; sides rounded and converging from base to apex, more quickly converging before the middle, anterior angles obtuse; basal margin bisinuate on either side, the medial lobe very broadly and obtusely rounded; upper surface rather closely punctured, impressed on either side at the base with a distinct fovea. Elytra rather broader than the thorax, regularly punctate-striate, the puncturing much finer towards the apex; interspaces plane, finely punctured. Hinder thighs strongly thickened; hinder tibiæ equal in length to the thighs, slightly incurved, the outer surface bicanaliculate.

Genus Pseudodera, Baly.

Pseudodera orientalis.

Elongata, parallela, convexa, rufo-picea, nitida, pedibus obscure piceis, abdomine rufo-fulvo; antennis nigris; elytris fortiter punctato-striatis, basi nigris, medio fasciâ latâ flavâ instructis, pone fasciam obscure rufo-piceis.

Long. 4 lin. *Hab.*—Bengal.

Vertex convex, smooth, minutely punctured on either side above the eye; antennæ two-thirds the length of the body, the apex of the basal joint pale rufo-piceous. Thorax rather broader than long; sides slightly diverging from the base to beyond the middle, thence rounded and converging to the apex; above moderately convex, very distantly impressed with fine punctures; basal groove short, deeply impressed, divided medially by a short lon-

Digitized by Google

gitudinal ridge; on either side, at a little distance from the transverse groove, is a short deep longitudinal depression. Elytra broader than the thorax, parallel, strongly punctate-striate, the striæ arranged in double rows; their basal fourth black, their middle third flavous, the remainder of the surface to the apex obscure piceous.

Genus CLITEA.

Corpus subelongato-ovale, convexum; *Caput* breve; *oculis* distantibus; *encarpis* et *carinâ* obsoletis; *antennis* filiformibus. *Thorax* transversus; margine basali utrinque bisinuato, medio distincte lobato. *Elytra* oblonga, punctato-striata. *Pedes* mediocres; *coxis* anticis prosterno æquialtis; *femoribus* posticis valde incrassatis; *tibiis* simplicibus, *anticis* quatuor apice spinâ parvâ armatis; *posticis* dorso bicanaliculato, spine apice validâ armatis; *tarsis* posticis articulo basali tibiæ dimidio multo breviori, duobus sequentibus conjunctis æquali; *unguiculis* appendiculatis. *Prosterum* elongatum, apice transversim dilatatum; *acetabulis* anticis integris. *Mesosternum* obliquum, apice emarginatum.

Type *Clitea picta.*

Nearly allied to *Mantura*, separated from that group by the short broad head, and by the absence of the perpendicular grooves at the base of the thorax.

Clitea picta.

Subelongato-ovalis, convexa, rufo-fulva, subnitida, subtus nitida; thorace rugoso-punctato, nigro, lateribus late rufo-fulvis; elytris fortiter puntato-striatis, interspatiis sat crebre punctatis, ad latera leviter convexiusculis; utrisque fasciâ latâ basali, extrorsum abbreviatâ, postice emarginatâ, fasciâ prope medium, utrinque abbreviatâ, maculâque subapicali, trigonatâ nigris.

Long. 2 lin. *Hab.*—India.

Head short, much broader than long; surface rugose; eyes distant; clypeus not separated from the upper face, its lower portion transversely excavated, its upper surface concave; antennæ half the length of the body, fulvous. Thorax nearly three times as broad as long; sides rounded and converging from base to apex, anterior angle pro-

Digitized by Google

duced, laterally curved, the apex obtuse; basal margin slightly oblique and bisinuate on either side, the medial lobe obtusely rounded; above transversely convex, closely rugulose-punctate, impressed with numerous variolose punctures, scattered irregularly over the whole surface. Elytra rather broader than the thorax, narrowly oblong, convex, deeply and regularly punctate-striate; the interspaces plane near the suture, slightly convex on the outer disk, closely punctured.

Genus Systena, Clark.

Systena ornata.

Elongata, convexa, obscure cuprea, nitida, antennis, pedibus abdomineque piceis, femoribus posticis abdomineque cupreo micantibus; elytris confuse punctatis, utrisque maculis duabus, unâ infra basin elongatâ, alterâ ante apicem oblongâ, margineque apicali flavis.

Long. 2 lin. *Hab.*—Jamaica.

Head coarsely punctured, the puncturing finer and less crowded on the vertex; carina slightly raised, smooth, impunctate; encarpæ ill-defined. Thorax more than one-half as broad again as long; sides nearly straight and parallel, anterior angles oblique, obtuse, hinder angles acute; disk strongly and rather closely punctured. Elytra broader than the thorax, narrowly oblong, strongly punctured, each elytron with the apical border and two small spots, the first linear placed below the base, the other subapical, oblong, flavous.

Systena Deyrollei.

Subelongata, convexa, nigra, nitida, pedibus antennisque fulvis, his extrorsum femoribusque posticis piceis; thorace distincte punctato; elytris oblongo-ovatis, convexis, infra basin transversim depressis, sat fortiter punctato-striatis, interspatiis planis, apicem versus et externis totis leviter convexiusculis.

Long. 1⅓ lin. *Hab.*—Brazil, New Friburg.

Head exserted; vertex and front sparingly impressed with fine punctures; interocular spaces separated from the front on either side by an oblique groove; encarpæ obsolete; carina narrow, elongate; antennæ rather more

Digitized by Google

than half the length of the body, the five lower joints fulvous, the rest piceous; the second moderately thickened, oval, more than three-fourths the length of the first, scarcely shorter than the third. Thorax nearly twice as broad as long; sides rather broadly margined, straight and parallel, slightly sinuate just behind the anterior angle, the latter obliquely truncate; basal margin slightly bisinuate on either side, narrowly margined; upper surface nitidous, finely but distinctly punctured. Elytra much broader than the thorax, oblong-ovate, slightly attenuated at the apex; convex, transversely depressed below the basilar space, the latter on each elytron distinctly raised; regularly punctate-striate, interspaces plane, slightly convex towards the apex and on the outer disk, smooth and shining, sparingly impressed with minute punctures, the interspaces next the suture more closely punctured.

Systena cæruleata.

Elongata, convexa, nitida, subtus nigra, pedibus pallide piceis, posticis obscurioribus; supra obscure cærulea, antennis fulvo-piceis, extrorsum piceis; thorace transverso, distincte punctato; elytris oblongo-ovatis, convexis, sat fortiter punctato-striatis, interspatiis lævibus, remote, minute punctatis, externis convexiusculis.

Long. 1⅔ lin. *Hab.*—Amazons, Pará; Santarem.

Head exserted, vertex and front convex, finely and remotely punctured, the latter separated from the lower face on either side by an oblique groove; encarpæ oblique, not contiguous, narrowly oblong; carina strongly raised, oblong, its apex obtuse; antennæ half the length of the body, piceous, the third to the fifth joints paler than the rest. Thorax nearly twice as broad as long; sides straight and parallel, all the angles thickened; the anterior obliquely truncate, the hinder ones acute; basal margin slightly sinuate on either side the medial lobe, the latter scarcely produced, obtusely truncate; upper surface transversely convex, distinctly but finely and remotely punctured. Scutellum trigonate, its apex acute. Elytra much broader than the thorax, oblong-ovate, convex, the convexity gradually increasing from the base to beyond the middle; strongly and regularly punctate-striate, the interspaces shining, sparingly impressed with very fine punctures, interspaces on the outer disk slightly convex.

Digitized by Google

Genus Phygasia, Baly.

Phygasia limbata.

Oblongo-ovata, convexa, nigra, nitida, thorace abdomineque fulvis; elytris flavis, tenuiter, confuse punctatis, utrisque nigro limbatis.

Long. 2½ lin. *Hab.*—South Africa, Lake N'Gami.

Head trigonate, scarcely longer than broad; vertex and front smooth and shining, impunctate, with the exception of a few coarse impressions on either side just above the upper and inner border of the eye; front separated on either side from the encarpæ by an oblique groove; encarpæ thickened, oblique, oblong, contiguous at their extreme apices; carina strongly raised, oblong-ovate, its apex acute, extending upwards between the encarpæ for nearly their whole length; labrum and jaws piceous; antennæ half the length of the body, moderately robust, slightly thickened towards the apex, four lower joints obscure fulvous, the rest black. Thorax twice as broad as long; sides distinctly margined, regularly rounded, anterior angles obtuse, the hinder ones armed with a small acute tooth; upper surface convex, finely but not closely punctured; basal groove deeply depressed, extending backward to the basal margin, abbreviated abruptly on either side at some distance from the lateral border. Elytra broader than the thorax, oblong, rounded at the apex; convex, more closely and more distinctly punctured than the thorax; yellow, the entire limb of each, dilated at base and apex, but narrowed on the suture and on the lateral margin, black.

Genus Longitarsus, Latr.

Longitarsus concinnus.

Anguste ovatus, convexus, pallide piceus, nitidus, tibiis anticis quatuor, tarsis posticis antennisque pallide flavis, harum articulis primo dorso et sexto ad nonum totis nigris; thorace sat crebre punctato; elytris ovalibus, crebre punctatis.

Long. ⅝ lin. *Hab.*—Mexico.

Head trigonate, lower portion of face moderately elongate; vertex smooth, impunctate, with the exception of two or three large punctures on either side, just above the upper border of the eye; encarpæ trigonate, contiguous;

Digitized by Google

carina linear, elevated, but less distinctly defined than in many other species; antennæ more than three-fourths the length of the body, robust. Thorax about one-fourth broader than long; sides slightly rounded, diverging from the base towards the apex, anterior angles very obliquely truncate, thickened obtuse; disk transversely convex, coarsely punctured, the punctures crowded at the base, more distant on the hinder disk. Elytra much broader than the thorax, oval, attenuated towards the apex, convex, the humeral callus entirely obsolete, surface coarsely and rather closely punctured.

Longitarsus Buckleyi.

Anguste ovatus, nitidus, subtus piceo-niger, pedibus (femoribus posticis piceis exceptis) fulvis; supra plumbeo-nigra, antennis nigris, basi piceo-fulvis; thorace tenuissime ruguloso; elytris oblongis, minute, subremote punctatis.

Long. 1 lin. *Hab.*—Ecuador; collected by Mr. Buckley.

Head trigonate; vertex and front shining, impunctate, the latter impressed on either side within the eye with a deep fovea; encarpæ transverse, contiguous, subovate; carina narrow, elongate; antennæ more than half the length of the body, the three lower joints piceo-fulvous, the fourth piceous, the rest black. Thorax half as broad again as long; sides rounded, their middle third sinuate, the anterior third occupied by the thickened anterior angle, the apex of which is obtuse; upper surface convex, impunctate, nitidous, closely covered with very minute rugosities, only visible under a lens. Scutellum trigonate, obscure piceous. Elytra broader than the thorax, oblong, their apices subacutely rounded; above convex, very finely and subremotely punctured, the humeral callus distinct.

Longitarsus Fryellus.

Anguste ovatus, convexus, piceus, nitidus, pedibus elytrisque pallide castaneis, illis piceo tinctis; antennis flavo-albidis, articulis primo (apice excepto) quinto ultimosque apice piceis, sexto, septimo et octavo nigris; thorace lævi; elytris ovatis, ad apicem attenuatis, tenuiter punctatis.

Long. 1 lin. *Hab.*—Brazil.

Vertex smooth, impunctate; carina elevated, linear; encarpæ ill-defined, subovate, oblique, contiguous; antennæ

Digitized by Google

robust, three-fourths the length of the body. Thorax about a third broader than long; sides rounded, slightly diverging from the base towards the apex, anterior angles thickened, very obliquely truncate, hinder angles obtusely angulate; disk convex (when seen under a lens very finely and distantly punctured). Elytra much broader than the thorax, ovate, truncate at the base, the sides parallel, attenuated towards the apex; above convex, the humeral callus distinct; finely punctured, the punctures piceous.

Longitarsus Wallacei.

Anguste ovatus, convexus, piceo-fulvus, nitidus, antennis flavis; subtus pallide piceus, pedibus flavo-albidis, femoribus tibiisque posticis piceo-fulvis; thorace lævi, ad latera minute punctato, lateribus obtuse angulatis; elytris oblongis, sat crebre subfortiter punctatis.

Long. $1\frac{1}{6}$ lin. *Hab.* — Celebes; collected by Mr. Wallace.

Head wedge-shaped; vertex impunctate; encarpæ well-defined, narrow, transverse, contiguous at their extreme apices; carina narrow, strongly elevated; antennæ three-fourths the length of the body, the third joint about one-half longer than the second, the fourth one-half longer than the third, the following joints each equal in length to the fourth, the eleventh rather longer. Thorax about a third broader than long; sides diverging from the base to the middle, thence straight to the anterior angle, the latter thickened, very obliquely truncate; above transversely convex, shining, a few fine punctures visible at the base and sides when seen under a strong lens. Elytra broader than the thorax, oblong, rather coarsely and closely punctured.

Longitarsus capensis.

Anguste ovatus, convexus, niger, nitidus, pedibus antennisque fulvis, his extrorsum, femoribusque posticis apice piceis; thorace fortiter, sat crebre punctato; elytris ovalibus, apice dehiscentibus, crebre punctatis.

Long. 1 lin. *Hab.*—Cape of Good Hope.

Head trigonate; vertex smooth, impunctate; front impressed on either side with a few irregular punctures; encarpæ nearly obsolete, ill-defined; carina elongate, elevated; antennæ three-fourths the length of the body, six outer joints pale piceous. Thorax about one-third as

Digitized by Google

broad again as long; sides diverging from the base towards the apex, anterior angles thickened, obliquely truncate; disk convex, coarsely and rather closely punctured, the interspaces granulose. Scutellum much broader than long. Elytra broader than the thorax, oval, convex, dehiscent at the sutural angle, the humeral callus entirely obsolete; their surfaces coarsely punctured.

Genus Docema, Waterhouse.

Docema collaris.

Ovata, convexa, nigra, nitida, facie inferiori, antennis basi, tibiis tarsisque piceis; thorace rufo, basi leviter transversim impresso, tenuiter, subremote punctato; elytris sat fortiter confuse punctatis.

Long. 1¼—1⅓ lin. *Hab.*—Western Australia.

Head trigonate, scarcely longer than broad; vertex smooth, impunctate; front impressed on either side near its lower edge with a deep fovea; interocular spaces punctate; encarpæ pyriform, contiguous; carina obsolete; antennæ rather more than half the length of the body, the three lower joints piceous, the rest black. Thorax more than twice as broad as long; sides rounded, anterior angles thickened, oblique, laterally produced; hinder angles armed with a small obtuse tooth; upper surface impressed just in front of the base with an ill-defined transverse groove, which terminates on either side at some distance from the lateral margin; disk finely but not closely punctured, the transverse groove rather more strongly punctured. Scutellum trigonate, shining, impunctate. Elytra broader than the thorax, broadly oblong-ovate, convex, strongly and somewhat closely punctured; interspaces here and there irregularly transversely wrinkled.

Genus Apræa.

Corpus ovatum, convexum, dorso paullo deplanatum. *Caput* vix exsertum; *facie* brevi, perpendiculari; *antennis* filiformibus; *encarpis* distinctis; *carinâ* vix elevatâ; *oculis* ovalibus. *Thorax* transversus, basi distincte lobatus. *Scutellum* semirotundatum. *Elytra* oblonga, regulariter punctato-striata. *Prosternum* oblongum, apice paullo dilatatum; *acetabulis* anticis apertis. *Mesosternum* obli-

Digitized by Google

quum, apice concavo-emarginatum. *Pedes* simplices; *coxis* anticis prosterno fere æquialtis; *femoribus* posticis incrassatis; *tibiis* anticis quatuor apice muticis; *tibiis* posticis dorso non canaliculatis, apice spinâ acutâ armatis; *tarsis* posticis articulo basali tibiæ dimidio paullo breviori; *unguiculis* appendiculatis.

Type *Aprœa Jansoni.*

The present genus differs from *Aphthona* in the absence of spines at the apices of the four anterior tibiæ and in the distinctly lobed basal margin of the thorax.

Aprœa Jansoni.

Ovata, convexa, picea, nitida, supra cupreo-micans aut piceo-cuprea, vertice pectoreque nigro-piceis, pedibus (femoribus posticis apice exceptis) antennisque fulvo-piceis, his apice nigro-piceis; thorace nitido, irregulariter hic illic profunde punctato; elytris oblongis, convexis, dorso paullo deplanatis, utrisque infra basin transversim depressis, regulariter punctato-striatis; interspatiis planis, sat remote, minute punctatis.

Long. 1¼ lin. *Hab.*—Jamaica.

Head subtrigonate; vertex and front nitidous, sparingly impressed with very minute punctures; encarpæ thickened, transversely ovate, separated at their point of junction by a deep fovea; carina narrowly oblong, attenuated towards its apex, its surface plane; antennæ filiform, rather more than half the length of the body, five lower joints piceo-fulvous, the rest nigro-piceous. Thorax more than twice as broad as long; sides rounded and converging from base to apex, the anterior angles thickened, obtuse; basal margin bisinuate on either side, the medial lobe moderately produced, obtusely rounded; upper surface transversely convex, excavated on either side at some distance from the lateral margin, coarsely and strongly punctate, the punctures irregularly congregated over the surface; interspaces nitidous, impressed, but not closely, with minute punctures. Elytra broader than the thorax, oblong, convex, transversely depressed below the basilar space, the latter very faintly thickened; strongly and regularly punctate-striate, interspaces plane, very faintly convex near the outer margin, sparingly impressed with very fine punctures.

Digitized by Google

Genus APHTHONA, Chevr.

Aphthona chinensis.

Ovalis, convexa, subtus nigra, nitida, pedibus fulvis, tarsis piceis; supra metallico-cærulea, antennis nigris, basi piceis; thorace subquadrato, lævi, impunctato; elytris thorace latioribus, ovatis, tenuiter, confuse punctatis.

Long. 1—1¼ lin. *Hab.*—China; collected by Mr. G. Lewis.

Vertex shining, impunctate; encarpæ distinct, subquadrate, oblique, contiguous at their apices; carina moderately raised, elongate; eyes rotundate, prominent; antennæ three-fourths the length of the body, three lower joints piceous, the rest black. Thorax only slightly broader than long; sides straight and parallel, the anterior angles thickened, obliquely truncate; above convex, shining, impunctate. Elytra much broader than the thorax, ovate, convex, finely punctured.

Aphthona crassicornis.

Breviter oblongo-ovata, convexa, nitida, subtus nigra, pedibus piceo-nigris, tarsis rufo-piceis; supra viridi-cyanea, antennis ad apicem incrassatis, nigris, basi piceis, articulis duobus ultimis albido-fulvis; vertice nitidissimo, impunctato; thorace fortiter, minus remote punctato; elytris infra basin transversim depressis, fortiter punctatis, punctis subseriatim dispositis.

Var. A. Elytris apice rufo-piceis.

—— B. Corpore toto piceo.

Long. 1 lin. *Hab.*—Jamaica.

Head scarcely broader than long; vertex broad, very smooth and shining, impunctate; front impressed on either side with a single fovea; encarpæ subtrigonate, well defined, contiguous; carina entirely obsolete; clypeus transverse, trigonate, its apex acute; antennæ half the length of the body, robust, distinctly thickened towards the apex, the outer joints slightly compressed; black, the four or five lower joints piceous, the two upper ones yellowish-white; the second joint thickened, ovate. Thorax twice as broad as long; sides rather broadly margined, parallel, bisinuate, the hinder angles acute, slightly produced, the anterior ones obliquely truncate, produced laterally into a short acute tooth; upper surface transversely convex, strongly and deeply, but not very closely punctured, inter-

Digitized by Google

spaces nitidous. Scutellum trigonate, its apex obtuse. Elytra broader than the thorax, oblong, regularly rounded at the apex; convex, transversely depressed below the basilar space; strongly punctured, the punctures indistinctly arranged in ill-defined longitudinal rows; interspaces shining, impunctate; on the transverse depression near the suture are some faint oblique wrinkles.

Aphthona Pilatei.

Ovata, convexa, nigro-ænea, nitida, antennis pedibusque fulvis, femoribus posticis piceis; thorace lævi; elytris tenuiter punctato-striatis, interspatiis planis, lævibus.

Long. $\frac{5}{6}$ lin. *Hab.*—Mexico, Teapa.

Head trigonate, not longer than broad, lower portion of face pale piceous; vertex smooth, impunctate; encarpæ oblique, contiguous, subovate, carina distinctly raised; antennæ more than half the length of the body, pale fulvous, the second joint moderately thickened, ovate, the third and fourth each about equal in length to the second. Thorax nearly twice as broad as long; sides parallel, scarcely rounded, anterior angles obliquely truncate; above convex, smooth and shining, impunctate. Elytra broadly oblong, slightly attenuated at the apex; convex, finely punctate-striate, the interspaces plane.

Aphthona Deyrollei.

Ovata, convexa, pallide picea, supra æneo micans; facie inferiori, pedibus antennisque fulvis, harum articulis 5—9 nigro-piceis; thorace lævi; elytris tenuiter punctato-striatis.

Long. 1 lin. *Hab.*—Mexico, Teapa.

Vertex smooth, impunctate; encarpæ well-defined, oval, transverse, contiguous; carina elongate, distinctly elevated; labrum and jaws nigro-piceous; antennæ three-fourths the length of the body, robust. Thorax more than one-half as broad as long; sides nearly straight, slightly diverging from the base towards the apex, anterior angles thickened, obliquely truncate; upper surface transversely convex, smooth and shining, impressed with a few minute punctures, visible only under a strong lens. Elytra broader than the thorax, ovate, slightly attenuated at the apex; convex, the humeral callus nearly obsolete; surface finely punctate-striate, the interspaces plane.

Digitized by Google

Aphthona diversa.

Subelongata, convexa, picea, nitida, vertice, scutello, pectore abdomineque nigro-piceis; thorace tenuiter punctato, rufo-fulvo, pedibus antennisque sordide fulvis, his extrorsum femoribusque posticis piceis; elytris viridi-metallicis, minus fortiter punctato-striatis.

Long. $\frac{1}{8}$ lin. *Hab.*—Mexico, Teapa.

Vertex and front black, impunctate, lower portion of face piceous; encarpæ oblique, distinctly thickened, ovate, contiguous; carina not defined; antennæ more than half the length of the body, robust, five lower joints obscure fulvous, the rest black; second and third joints nearly equal in length. Thorax nearly twice as broad as long; sides parallel, nearly straight, anterior angles thickened, obliquely truncate, produced laterally into a short acute tooth; upper surface convex, shining, impressed somewhat remotely with very fine punctures; basal margin narrowly edged on either side with black. Scutellum semiovate. Elytra much broader than the thorax, oblong, distinctly and regularly punctate-striate, the interspaces plane, each impressed with a single row of minute punctures.

Aphthona verticalis.

Subelongata, convexa, fulva, nitida, vertice, scutello, metasterno abdomineque nigris, antennis extrorsum infuscatis; thorace lævi, impunctato, elytris viridi-cyaneis, regulariter punctato-striatis.

Long. $\frac{1}{8}$ lin. *Hab.*—Brazil; New Friburg.

Head trigonate; eyes large, prominent, black; vertex and upper portion of front shining black, impunctate; encarpæ obliquely transverse, contiguous, elongate; carina ovate; antennæ robust, three-fourths the length of the body, second joint short, thickened, ovate, rather more than half the length of the basal one; third rather longer than the latter; seven outer joints slightly stained with fuscous. Thorax nearly twice as broad as long; sides rather broadly margined, regularly rounded, hinder angles armed with a short acute tooth, the anterior ones obtuse; surface shining impunctate; on the middle of the basal margin is a faint transverse groove, only visible in a certain light. Scutellum much longer than broad, wedge-shaped, its apex obtuse. Elytra much broader than the thorax, narrowly oblong, convex, bright metallic green,

Digitized by Google

with a bluish shade; regularly and rather strongly punctate-striate, the punctures on the striæ near the suture less regularly placed than those on the outer striæ; interspaces plane, shining, impunctate.

Aphthona nigro-cyanea.

Subelongata, convexa, nitida, subtus nigro-cyanea, pedibus fulvis; supra nigro-cærulea, metallica, antennis fulvis, extrorsum nigris; thorace remote punctato; elytris sat fortiter striatim punctatis, punctis in striis confuse dispositis; interspatiis lævibus.

Long. 1—1¼ lin. *Hab.*—Brazil, New Friburg.

Head trigonate; vertex nitidous, sparingly impressed with a few fine punctures; front impressed along its lower edge on either side with four or five stronger punctures, its medial portion with a faint longitudinal depression; encarpæ very distinct, narrow, elongate, obliquely transverse, separated by a deep fovea; carina obsolete; clypeus subtrigonate, its upper portion thickened; labrum and jaws piceous; antennæ half the length of the body, six lower joints fulvous, the apices of the fifth and sixth stained with piceous, the five outer ones black; the second joint short, ovate, the third nearly twice as long as the second. Thorax nearly three times as broad as long; sides rather broadly margined, regularly rounded, anterior angles obtuse, the hinder ones acute; upper surface remotely impressed with fine but deep punctures. Elytra broader than the thorax, narrowly oblong, convex, slightly flattened along the suture, rather strongly punctate-striate, the punctures on each stria very irregularly arranged, those near the suture very confused; interspaces smooth and shining, sparingly impressed with minute punctures.

Aphthona fulvipes.

Anguste ovata, convexa, nigra, nitida, antennis pedibusque fulvis, femoribus posticis piceis; thorace sat remote, tenuiter punctato; elytris convexis, utrisque infra basin leviter transversim depressis, fortiter punctato-striatis, interspatiis planis, externis obsolete convexiusculis.

Long. ¾ lin. *Hab.*—Pará.

Head trigonate; vertex and front shining, impunctate; encarpæ well-defined, transverse, contiguous at their apices; carina raised, narrow, linear; labrum and jaws

Digitized by Google

piceo-fulvous; antennæ nearly equal to the body in length, fulvous, the apical joint stained above with piceous; second joint thickened, ovate, nearly equal in length to the first, rather longer than the third. Thorax rather more than half as broad again as long; sides parallel, straight at the base, slightly rounded before the middle, anterior angles obliquely truncate, produced laterally into a very short acute tooth; upper surface convex, remotely punctured, the punctures very faint and more distant on the anterior disk, rather deeper and rather more crowded near the base; each of the four angles furnished with a single very long white hair. Elytra much broader than the thorax, convex, each depressed transversely before the middle, strongly punctate-striate, the striæ much less deeply punctured towards the apex; interspaces plane, faintly convex on the outer disk.

Aphthona amazona.

Oblongo-ovata, convexa, nigra, nitida, antennarum basi pedibusque piceis, his nigro pictis; thorace lævi, minute sed parce punctato, vertice fere impunctato; elytris tenuiter punctato-striatis, interspatiis planis.

Long. 1 lin. *Hab.*—Amazons, Pará.

Head trigonate; vertex and front shining, impunctate; encarpæ large, ill-defined, ovate, contiguous; carina well-defined, elongate, attenuated at base and apex; antennæ more than half the length of the body, the three lower joints pale piceous, the rest black. Thorax nearly twice as broad as long; sides moderately rounded, anterior angle obliquely truncate, its outer end produced laterally into a short acute tooth; upper surface convex, nitidous, sparingly impressed with minute punctures on the basal half of the disk, the anterior half nearly impunctate. Elytra broader than the thorax, regularly rounded at the apex; convex, very finely punctate-striate, interspaces plane, sparingly impressed with very minute punctures. Legs pale piceous, thighs and tibiæ stained with black or dark piceous.

Genus PHYLLOTRETA, Foudras.

Phyllotreta jamaicaensis.

Elongata, angustata, modice convexa, nitida, subtus nigra, tibiis tarsisque obscure piceis; supra cyaneo-viridis,

Digitized by Google

antennis nigris, basi pallide piceis; thorace sat crebre punctato, lateribus rotundatis, angulis posticis late rotundatis, fere obsoletis; elytris sat crebre punctatis.

Long. $\frac{7}{8}$ lin. *Hab.*—Jamaica.

Head exserted, subtrigonate; vertex and front distantly punctured, the latter impressed on either side above the encarpa with a deep fovea; encarpæ triangular, contiguous; carina raised, linear, elongate; clypeus rugose on either side the carina, its anterior surface oblique, smooth, impunctate; antennæ nearly three-fourths the length of the body, slightly thickened towards the apex, the five lower joints piceous, the rest black. Thorax about one-fourth broader than long; sides rounded, the hinder angles broadly so, nearly obsolete, the anterior ones thickened, obliquely truncate; disk rather coarsely punctured, their interspaces irregularly strigose. Elytra much broader than the thorax, narrowly oblong, convex, coarsely punctured.

Phyllotreta malayana.

Elongata, parallela, nigra, nitida, pedibus anticis quatuor obscure piceis; supra obscure nigro-cærulea, sat rude punctata; antennis nigris, basi piceo-fulvous.

Long. 1 lin. *Hab.*—Celebes.

Head trigonate, rather longer than broad; clypeus obscure piceous; vertex shining, impunctate; encarpæ well defined, triangular, contiguous; carina raised, its apex acute; antennæ nearly three-fourths the length of the body, robust; five lower joints obscure fulvous, more or less stained with piceous, the rest black. Thorax nearly twice as broad as long; sides parallel, slightly convex, the anterior angles obliquely truncate, produced laterally into an obtuse tooth; upper surface coarsely but not deeply punctured, the interspaces granulose. Elytra rather broader than the thorax, their sides parallel; upper surface more deeply punctured than the thorax, the interspaces shining, impunctate.

Phyllotreta Downesi.

Elongata, convexa, viridi-metallica, cyaneo tincta, antennis nigris; subtus nigra, femoribus posticis viridi-metallicis; thorace granuloso, sat fortiter punctato;

Digitized by Google

elytris sat crebre, fortiter punctatis, pone medium obsolete elevato-vittatis.

Long. 1½ lin. *Hab.*—Bombay; collected by Dr. E. Downes.

Head smooth; vertex nearly impunctate, faintly rugulose, front above the encarpæ rugose-punctate; encarpæ quadrangular, contiguous; carina strongly raised, linear; antennæ more than two-thirds the length of the body; three lower joints piceous, stained with nigro-æneous; second and third joints short, equal. Thorax nearly twice as broad as long; sides nearly parallel at the base, thence rounded and converging to the apex, anterior angles thickened, obliquely truncate; upper surface granulose, rather closely covered with round, shallow punctures. Scutellum shining black, trigonate, its apex obtuse. Elytra narrowly ovate, more deeply punctured than the thorax, interspaces granulose; below the middle of each elytron are several narrow, distinctly raised vittæ. Body beneath shining black, smooth, nearly impunctate.

Genus Chætocnema, Stephens.

Chætocnema divergens.

Anguste ovata, convexa, nitida, subtus nigra, pedibus rufo-piceis, femoribus posticis nigro-æneis; supra nigro-ænea, antennis fulvis, articulo ultimo piceo; thorace lateribus rectis, a basi ad apicem paullo divergentibus, disco granuloso, remote, sat tenuiter punctato; elytris fortiter punctato-striatis, interspatiis convexiusculis, ad apicem et iis ad latera convexis.

Long. ¾ lin. *Hab.*—Campeche.

Head moderately exserted, trigonate; vertex and front granulose, impressed on either side with a few irregular punctures; oblique grooves separating the interocular spaces from the front distinct; clypeus oblique on its lower half, thickened towards its apex, the latter broadly truncate, separated from the upper face by a deep transverse depression; labrum piceous, impressed with a single row of deep punctures; antennæ more than half the length of the body, fulvous, the apical joint piceous; second joint moderately thickened, nearly as long as the first, distinctly longer than the third. Thorax nearly twice as broad as long; sides rather broadly margined, straight and diverging from base to apex, the anterior angles oblique, thickened,

Digitized by Google

obtuse; upper surface granulose and rather distantly punctured. Elytra broader than the thorax, ovate; above convex, strongly and regularly punctate-striate; interspaces slightly convex, more strongly so on the outer disk and towards the apex, nitidous, here and there faintly wrinkled, the rugosities being visible only when viewed under a strong lens; inflexed limb smooth and shining, impressed along its inner edge with a single row of punctures. Nearly allied to *C. Mexicana;* separated from that species by its rather broader form and by the diverging sides of the thorax.

Chætocnema gravida.

Late ovata, valde convexa, cuprea, nitida, pedibus antennisque obscure fulvis, his extrorsum piceis, femoribus anticis quatuor piceo-tinctis, posticis cupreis; clypeo crasse punctato; thorace sat fortiter punctato; elytris regulariter punctato-striatis, interspatiis granulosis, planis, externis vix convexiusculis.

Long. 1¼ lin. *Hab.*—Mexico; Teapa.

Vertex distantly punctured; clypeus trigonate, deeply and closely punctured; encarpæ and carina entirely obsolete. Thorax twice as broad as long at the base; sides rounded and converging from base to apex, all the angles acute; upper surface impressed, but not very closely, with deep punctures. Scutellum transverse, its apex broadly rounded. Elytra slightly broader at the base than the thorax, attenuated towards the apex, strongly and regularly punctate-striate, interspaces finely granulose, plane, those near the outer margin faintly convex.

Chætocnema Sallei.

Anguste ovata, convexa, cuprea, nitida, supra granulosa, antennis obscure fulvis, extrorsum piceis; pedibus obscure fulvis, piceo-tinctis, femoribus posticis cupreis; vertice distincte punctato; thorace sat fortiter punctato; elytris regulariter punctato-striatis, interspatiis remote punctatis, externis leviter convexis.

Long. 1⅓ lin. *Hab.*—Mexico.

Vertex distinctly but not closely punctured; clypeus trigonate, more closely punctured than the vertex; encarpæ and carina obsolete; antennæ slightly thickened towards the apex, rather more than half the length of the

Digitized by Google

body, six lower joints obscure fulvous, the rest piceous. Thorax nearly twice as broad as long; sides obliquely converging from base to apex, anterior angles very obliquely truncate; above subcylindrical, impressed with large round punctures, crowded on the sides, more distant on the disk. Scutellum transverse, its apex broadly rounded. Elytra rather broader than the thorax, attenuated towards the apex, strongly and regularly punctate-striate; interspaces plane on the inner disk, convex near the outer margin and faintly so towards the apex; their surfaces rather coarsely granulose, distantly impressed with fine punctures.

Chætocnema pallidicornis.

Anguste ovata, convexa, cuprea, nitida, subtus piceo-nigra, antennis pedibusque flavis, femoribus piceis; capite thoraceque granulosis, illo impunctato, hoc sat remote, minute punctato; elytris infra basin leviter transversim depressis, regulariter punctato-striatis, striis impressis; interspatiis minute granulosis.

Long. 1¼ lin. *Hab.*—Jamaica.

Vertex granulose, impunctate, front separated on either side from the interocular space by an oblique groove; clypeus thickened towards the apex, the latter obtuse, separated from the upper face by a deep transverse groove; encarpæ and carina entirely obsolete; antennæ more than half the length of the body, the two upper joints stained with fuscous. Thorax nearly twice as broad as long; sides rather broadly margined, parallel, slightly rounded; anterior angles thickened, obtuse, obliquely truncate; upper surface convex, granulose, minutely and rather distantly punctured; basal margin reflexed, bordered with a single row of distinct punctures. Elytra much broader than the thorax, ovate, attenuated at the apex; above convex, transversely depressed below the basilar space, strongly punctate-striate, the striæ distinctly sulcate; interspaces finely granulose, here and there impressed with very minute punctures; interspaces on the inner disk nearly plane, those near the outer margin convex. Four anterior thighs pale piceous, the hinder pair darker, tinged with cupreous.

The transverse depression on the elytra will at once separate this species from its allies.

Digitized by Google

Chætocnema Steinheili.

Ovata, convexa, nitida, subtus nigra, pedibus piceo-fulvis, femoribus posticis piceo-cupreis; supra cuprea, granulosa, antennis fulvis, extrorsum piceis; capite minute et remote punctato; thorace tenuiter, sat remote punctato; elytris minus fortiter, regulariter punctato-striatis, interspatiis impunctatis, externis leviter incrassatis.

Long. $\frac{2}{3}$ lin. *Hab.*—Columbia; Magdalena River.

Head not longer than broad; eyes distant; forehead broad; vertex and front finely and remotely punctured; oblique grooves separating the interocular spaces from the front distinct, finely impressed; clypeus not distinctly separated from the upper face; antennæ half the length of the body, robust, slightly thickened towards the apex, the four basal joints fulvous, the rest piceous; second to the fifth joints nearly equal in length; the second thickened, two-thirds the length of the basal one. Thorax twice as broad as long; sides rounded, slightly sinuate at the base, the anterior angles thickened; above convex, the hinder margin distinctly reflexed; surface granulose, finely punctured, the punctures rather coarser and rather more closely placed than those on the head. Elytra broader at the base than the thorax, attenuated from the middle to the apex; above convex, closely united at the suture, nitidous, regularly punctate-striate, interspaces granulose, thickened on the outer disk.

Very similar in form, both of body and antennæ, to *C. Blanchardi*, but differing in its smaller size, and in its broader, distinctly punctured head.

Chætocnema separata.

Elongato-ovata, convexa, nitida, subtus nigra, pedibus fulvo-piceis, femoribus posticis obscure cupreis; supra æneo-cuprea, antennis nigris, basi fulvis; thorace granuloso, tenuiter, subremote punctato; elytris nitidis, fortiter punctato-striatis; interspatiis ad apicem convexis, externis totis convexis.

Long. 1 lin. *Hab.*—Bogota.

Head subtrigonate; vertex and front granulose, impressed on either side near the eye with four or five deep punctures; grooves separating the interocular space from the front deeply impressed; clypeus transverse, trigonate,

Digitized by Google

transversely impressed close to the anterior margin, the margin itself reflexed; its upper surface distinctly thickened and forming an ill-defined carina towards its apex, the latter obtuse, separated from the face by an angular groove; antennæ about half the length of the body, three lower joints obscure fulvous, the following two piceous, the rest black. Thorax scarcely twice as broad as long; sides nearly parallel, obtusely rounded, the anterior angles thickened, obtuse; upper surface granulose, finely but not closely punctured; basal margin narrowly reflexed on either side, impressed with a single row of deeper punctures. Elytra broader than the thorax, oblong, nitidous, strongly and deeply punctate-striate, the punctures large, round; interspaces convex towards the apex and on the outer disk; on their surfaces a few very fine punctures are to be seen when viewed under a strong lens.

Separated from *C. amazona* and *braziliensis* by its narrower form.

Chætocnema labiata.

Ovata, convexa, nitida, subtus nigra, pedibus pallide piceis, femoribus obscurioribus, femoribus posticis nigro-æneo tinctis; supra nigro-ænea, antennis pallide piceis, extrorsum nigris; thorace granuloso, minute et remote punctato, lateribus intra marginem leviter incrassatis; elytris sat fortiter punctato-striatis, interspatiis nitidis, convexiusculis, externis convexis.

Long. $\frac{5}{8}$ lin. *Hab.*—Columbia, Santa Martha.

Head subtrigonate; vertex and front granulose, impressed on either side near the eye with several irregular foveæ; grooves separating the interocular spaces from the front very distinct; clypeus trigonate, the sides sinuate, the apex obtusely truncate, separated from the upper face by an indistinct groove; labrum large, piceous, strongly exserted; antennæ more than half the length of the body, six lower joints pale piceous, the rest black; second joint thickened, more than two-thirds the length of the first, about equal in length to the third, the latter slender. Thorax nearly three times as broad as long; sides parallel, very obtusely rounded, the anterior angles oblique, thickened, obtusely rounded; upper surface transversely convex, granulose, very minutely punctured; sides within the lateral margin obsoletely thickened. Elytra broadly ovate, broader than the thorax, convex, strongly and deeply

Digitized by Google

punctate-striate; the interspaces nitidous, faintly convex, more strongly so towards the apex of the elytron, and on the outer disk; interspaces near the outer margin subcostate; each interspace with a single row of very minute punctures, visible only under a strong lens.

C. labiata may be known from its congeners by its small size and by its very finely-punctured thorax.

Chætocnema Haroldi.

Anguste ovata, convexa, cuprea, subtus nigra, nitida, antennis piceo-fulvis, his extrorsum pedibusque piceis; thorace granuloso, distincte punctato; elytris ovalibus, regulariter, sat fortiter punctato-striatis, interspatiis nitidis, convexiusculis, ad latera convexis.

Long. 1 lin. *Hab.*—Bogota.

Vertex and front granulose, the former impressed with a distinct fovea, the latter impressed on either side with a few distinct punctures; encarpæ and carina entirely obsolete; clypeus trigonate, slightly convex, its apex truncate, separated from the upper face by a deep transverse groove; antennæ half the length of the body, four upper joints piceous. Thorax nearly twice as broad as long; sides parallel, nearly straight, the anterior angles thickened, oblique; hinder ones slightly produced, acute; upper surface convex, granulose, distinctly but not closely punctured. Elytra broader than the thorax, oval, strongly punctate-striate; interspaces shining, impunctate; when seen under a deep lens, very finely wrinkled.

Chætocnema amazona.

Ovata, convexa, cuprea, nitida, subtus nigra, antennis pedibusque obscure fulvis, illis extrorsum femoribusque anticis quatuor piceis, femoribus posticis cupreis; thorace minute granuloso, tenuiter sed distincte punctato; elytris regulariter punctato-striatis, interspatiis ruguloso-granulosis, leviter convexiusculis, ad latera convexis.

Long. $\frac{5}{8}$ lin. *Hab.*—Amazons, Santarem.

Vertex and front granulose, the latter impressed on either side with a few deep punctures, sometimes arranged in an oblique row; encarpæ and carina entirely obsolete, clypeus trigonate, slightly convex, its apex obtusely truncate, separated from the upper face by a transverse groove; antennæ scarcely half the length of the body, five outer

Digitized by Google

joints stained with piceous; labrum and jaws sometimes piceous. Thorax nearly twice as broad as long; sides parallel, very slightly rounded, anterior angles thickened, obliquely truncate, hinder angles acute; upper surface granulose, finely but distinctly punctured. Scutellum semirotundate. Elytra broader than the thorax, oblong-ovate, attenuated towards the apex, convex, regularly punctate-striate, interspaces finely granulose, faintly wrinkled, each impressed with a single row of very fine punctures.

The punctuation both of the thorax and elytra varies somewhat in degree in different individuals; the species is apparently common.

Chætocnema braziliensis.

Anguste ovata, convexa, nitida, subtus nigra, pedibus fulvo-piceis, femoribus posticis piceo-cupreis; supra cuprea, æneo tincta, antennis fulvis, extrorsum rufo-piceis; thorace granuloso, evidenter, minus remote punctato; elytris sat fortiter punctato-striatis, interspatiis nitidis, convexiusculis, externis convexis.

Long. ¾ lin. *Hab.*—Brazil.

Head not longer than broad, subtrigonate; vertex and front granulose, impressed on either side with four or five round punctures; oblique grooves separating the interocular spaces from the front distinct, deeply impressed; carina oblong, well defined on the sides, its surface plane, not raised above the disk of the clypeus; its apex separated from the face by a transverse groove; antennæ more than half the length of the body, fulvous, slightly stained with rufo-piceous towards the apex; second joint moderately thickened, nearly as long as the first, equal in length to the third. Thorax twice as broad as long; sides rounded and converging from base to apex, nearly parallel at the extreme base; anterior angles thickened, oblique; upper surface coarsely granulose, impressed with distinct, aciculate, subremote punctures. Elytra broader than the thorax, ovate, attenuated at the apex; convex, regularly punctate-striate; interspaces nitidous, irregularly wrinkled at the extreme base near the suture, slightly convex, more strongly so near the outer margin; on each interspace (when viewed under a strong lens) are seen a few minute punctures.

Digitized by Google

Chætocnema Blanchardi.

Haltica ænea, Blanch. Gay. Hist. Chil. v. p. 557 (1851).

Ovata, convexa, ænea, nitida, subtus piceo-ænea, pedibus rufo-piceis, femoribus obscurioribus, antennis nigris, basi rufo-piceis; thorace remote, tenuiter punctato; elytris viridi-tinctis, pone medium attenuatis, regulariter, minus fortiter punctato-striatis, interspatiis planis, interspatio externo ante medium incrassato.

Long. 1 lin. *Hab.*—Chili.

Head subtrigonate; vertex and front impunctate, finely and irregularly granulose-strigose; grooves separating the interocular spaces from the front distinct; encarpæ and carina entirely obsolete; clypeus plane, clothed with griseous hairs, separated from the upper face by an angular groove; labrum black; antennæ half the length of the body, robust, slightly thickened towards the apex, five outer joints black, the others rufo-piceous; second to the fifth joints equal in length. Thorax twice as broad as long; sides converging from the base to beyond the middle, thence more quickly rounded to the apex, anterior angles thickened, slightly produced, subacute; upper surface minutely reticulate-granulose, finely and remotely punctured; on the basal margin on either side is a single row of deeper punctures. Scutellum transverse, broadly rounded. Elytra broader than the thorax at the base, sides attenuated from their middle to the apex; above convex, distinctly and regularly punctate-striate, interspaces plane, finely granulose-reticulate; the anterior half of the outer interspace thickened.

Dibolia ænea, Waterhouse, described in the Ent. Trans. for 1838, belongs to the present genus; I have, therefore, been compelled to change the name given by Blanchard to the above insect; *D. nigro-ænea* and *ochracea*, Waterh. are also true species of *Chætocnema*.

Chætocnema rugiceps.

Breviter ovata, valde convexa, cupreo-ænea, nitida, tibiis, tarsis antennisque pallide piceis, his apice nigro-piceis; vertice tumido, rude rugoso; thorace subfortiter punctato, interspatiis granulosis; elytris fortiter punctato-striatis, punctis in striâ primâ totâ, et in secundâ basi

Digitized by Google

confuse dispositis; interspatiis ad latera et ad apicem convexiusculis, minute et remote punctatis.

Long. 1½—1¾ lin. *Hab.*—Madagascar.

Vertex and front swollen, coarsely rugose, the latter separated from the lower face by a deeply-grooved line; clypeus large, pentangular, its apex truncate, its surface impressed with large round punctures; the anterior margin depressed, from the middle of the depression a narrow wedge-shaped longitudinal ramus extends upwards on the disk for about a third of its length; antennæ half the length of the body, robust, the six outer joints dark piceous. Thorax at the base nearly three times as broad as long; sides rounded and converging from base to apex, the anterior angles slightly produced, subacute; upper surface transversely convex, granulose, impressed with distinct round punctures; the middle portion of the basal margin, together with the whole of the apical one, raised and flattened, shining, impunctate. Scutellum twice as broad as long, broadly rounded. Elytra broader than the thorax, their sides nearly parallel, their apices regularly rounded; inflexed limb smooth and shining, impressed on the inner edge by a single row of punctures.

Chætocnema madagascarensis.

Late ovata, convexa, nitida, subtus picea, femoribus posticis cupreis; supra piceo-cuprea, antennis fulvis, ad apicem infuscatis; thorace granuloso, subnitido, minute, subremote punctato; elytris piceis, cupreo micantibus; interspatiis nitidis, ad apicem convexiusculis, externis convexis.

Long. 1 lin. *Hab.*—Madagascar.

Head subtrigonate, not longer than broad; vertex granulose, very finely and subremotely punctured; clypeus pentangular, broader than long, its apex broadly truncate, separated from the upper face by a broad, transverse groove; its surface granulose, the disk impunctate, the sides coarsely punctured; labrum excavated on either side, the medial space longitudinally elevated; antennæ half the length of the body, pale fulvous, two or three outer joints stained with fuscous. Thorax more than twice as broad as long; sides slightly rounded and slightly converging from base to apex, the anterior angles thickened, obliquely truncate; upper surface granulose, very finely

Digitized by Google

and subremotely punctured; basal border narrowly margined, impressed with a single row of deep punctures. Elytra broader than the thorax, broadly oblong-ovate, slightly attenuated at the apex, strongly punctate-striate, interspaces (when seen under a strong lens) very minutely punctured; on the inner disk before the middle they are faintly transversely wrinkled.

Chætocnema parvula.

Ovata, convexa, cupreo-nigra, nitida, subtus piceo-nigra, femoribus piceis, posticis apice exceptis nigris, tibiis tarsisque fulvis, piceo-tinctis; capite lævi, cupreo, antennis fulvis, extrorsum nigro-piceis; thorace subcrebre punctato, punctis oblongis, leviter impressis, ad latera magis remotis; elytris fortiter punctato-striatis, interspatiis planis, externo ante medium incrassato.

Long. $\frac{1}{8}$ lin. *Hab.*—Ceylon.

Head rotundate, vertex and front impunctate, very finely granulose; front impressed on either side above the eye with a short longitudinal sulcation, which runs downwards into the oblique groove separating the interocular space from the front; immediately exterior to the sulcation is a single round fovea; encarpæ obsolete; carina narrowly oblong, its lower apex acuminate; antennæ more than half the length of the body, four lower joints fulvous, the rest pitchy-black. Thorax more than twice as broad as long; sides converging and rounded from base to apex, the anterior angles thickened, nearly perpendicular; above transversely convex, nitidous, impressed, but not deeply, with oblong punctures; hinder border distinctly margined, impressed with a single row of deeper punctures. Elytra broader than the thorax at the base, attenuated towards the apex, convex, regularly punctate-striate; the interspaces plane, each impressed with a single row of minute punctures; anterior half of outer interspace thickened.

Chætocnema basalis.

Breviter ovata, nigro-ænea, nitida, pedibus obscure fulvis, piceo-tinctis, femoribus posticis nigro-æneis; antennis fulvis, extrorsum infuscatis; thorace lævi, disco punctis oblongis subremotis, leviter impresso, basi serie unicâ punctorum distinctorum magis fortiter impresso;

Digitized by Google

elytris regulariter punctato-striatis, interspatiis lævibus, externis convexis.

Long. ⅞ lin. *Hab.*—India.

Head trigonate, vertex and front shining, reticulate-granulose, impunctate, the latter impressed on either side just above the eye with a large double fovea; oblique grooves separating the interocular spaces from the front distinct; carina oblong, its apex obtuse, separated from the upper face by a distinct impression; antennæ nearly three-fourths the length of the body, seven or eight outer joints stained with piceous. Thorax more than twice as broad as long; sides rounded and converging from base to apex, anterior angles thickened, slightly produced, subacute; upper surface nitidous, impressed rather remotely with shallow, oblong punctures; at the extreme base is a single row of deeper punctures. Elytra broader than the thorax, broadly oblong, slightly attenuated at the apex; convex, regularly and rather strongly punctate-striate; interspaces plane, nitidous, those near the outer margin convex; inflexed limb nitidous, impressed on its inner edge with a single row of punctures.

Chætocnema Westwoodi.

Anguste ovata, convexa, nitida, subtus piceo-cuprea, pedibus fulvis, femoribus posticis piceis, cupreo tinctis; supra cuprea, antennis fulvis, extrorsum piceis; thorace crebre foveolato-punctato; elytris fortiter punctato-striatis, striâ primâ et interspatio primo confuse punctatis; interspatiis nitidis, hic illic obsolete, irregulariter granuloso-strigosis, ad apicem, nec non externis totis, convexis.

Long. 1 lin. *Hab.*—Batchian.

Head trigonate; vertex broad, convex, and, together with the front, closely covered with large round punctures; interspaces on the sides elevate-reticulate; grooves separating the interocular spaces from the front nearly obsolete; interocular spaces coarsely punctured; labrum black; antennæ about half the length of the body, fulvous, the five outer joints piceous; second joint moderately thickened, ovate, more than half the length of the first; third, fourth and fifth each equal in length to the basal one. Thorax twice as broad as long; sides parallel at the base, rounded and converging before the middle, anterior angles thickened, slightly produced, subacute;

Digitized by Google

upper surface nitidous, closely covered with large round, deeply-impressed punctures, rather less crowded on the middle of the disk; interspaces on the sides faintly elevate-reticulate. Elytra broader than the thorax, ovate, attenuated towards the apex, convex, strongly punctate-striate, the stria next the suture irregularly punctured; interspaces plane, thickened near the apex, the interspaces near the outer margin convex for their whole length; interspace between the first stria and the suture covered with deep punctures, equal in size to those on the striæ; inflexed limb deeply and closely punctured.

Chætocnema nitens.

Breviter ovata, convexa, nigro-cuprea, nitida; antennis fulvis, extrorsum pallide piceis; subtus nigra, pedibus fulvis, femoribus posticis nigro-piceis; thorace obsolete, sat remote punctato, basi serie unicâ punctorum distinctorum impresso; elytris fortiter et regulariter punctato-striatis, interspatiis lævibus, planis, externis vix convexiusculis.

Long. $\frac{2}{3}$ lin. *Hab.*—Batchian; collected by Mr. Wallace.

Head rotundate, granulose-strigose; front impressed on either side with two or three deep foveæ; encarpæ obsolete; carina defined, not elevated, oblong, its apex acute, contiguous with the front; clypeus triangular, coarsely punctured on either side the carina; antennæ three-fourths the length of the body. Thorax more than twice as broad as long; sides straight and slightly converging from the base to just beyond their middle, thence rounded and converging to the apex, anterior angles obtuse; upper surface very finely and rather distantly punctured, interspaces shining, impunctate; basal margin impressed with a single row of large punctures. Scutellum scarcely broader than long, semirotundate. Elytra broader than the thorax, oblong-ovate, convex, strongly and deeply punctate-striate; interspaces shining, plane, those on the extreme outer edge very slightly convex; a few very minute punctures, only visible under a deep lens, are scattered over their surfaces.

Chætocnema malayana.

Oblongo-ovata, convexa, subtus nigra, supra læte cuprea, nitida, pedibus antennisque rufo-fulvis, his extrorsum

Digitized by Google

piceis, femoribus posticis piceo-cupreis; capite rude punctato; thorace sat crebre, foveolato-punctato; elytris concinne punctato-striatis, striis apicem versus per paria dispositis.

Long. 1¼ lin. *Hab.*—Malay Archipelago.

Head not longer than broad, trigonate, vertex broad, deeply rugose-punctate, interspaces granulose; encarpæ and carina entirely obsolete; front separated from the interocular space on either side by a fine, oblique groove; clypeus coarsely punctured, its apex truncate, separated from the upper face by a transverse groove; antennæ half the length of the body, four lower joints rufo-fulvous; the second joint moderately thickened, more than half the length of the first, the third rather longer than the second. Thorax twice as broad as long; sides straight and parallel, rounded and converging in front, anterior angles thickened, slightly produced, subacute; upper surface closely covered with large, deeply impressed, round punctures; on the middle disk the puncturing is less crowded, and on its hinder half is a small longitudinal space entirely free from punctures; interspaces shining, impunctate, those on the sides transversely elevate-reticulate. Elytra broader than the thorax, attenuated at the apex, closely covered with large round punctures, arranged in longitudinal rows, those on the hinder disk approximate in pairs, near the apex of the elytron these double rows dwindle into single ones; interspaces nitidous, finely granulose-reticulate, each alternate interspace obsoletely thickened, and forming when viewed in a certain light a faint longitudinal costa; towards the apex these costæ are much more distinct; on the anterior disk the surface is irregularly wrinkled.

Chætocnema Wilsoni.

Ovata, convexa, nitida, subtus nigra, pedibus piceis, femoribus posticis cupreo tinctis; tibiis tarsisque obscure piceo-fulvis; supra cupreo-ænea, antennis fulvis, extrorsum piceis; thorace sat fortiter, subcrebre punctato; elytris fortiter punctato-striatis, striâ primâ confusâ; interspatiis lævibus, remote, minute punctatis, ad apicem nec non ad latera convexiusculis.

Long. 1¼ lin. *Hab.*—South Australia.

Head not longer than broad; vertex very minutely and irregularly strigose; front distinctly but finely ru-

Digitized by Google

gose, impressed on either side, near the upper angle of the eye, with three or four deep punctures; groove separating the front from the interocular space well defined; clypeus slightly broader than long, its apex obtusely truncate; antennæ about half the length of the body. Thorax more than twice as broad as long; sides converging from base to apex, slightly convex; anterior angles thickened, broadly and obliquely truncate; disk strongly punctured. Elytra oblong-ovate, attenuated towards the apex, convex, strongly punctate-striate, the puncturing on the first stria irregularly placed; interspaces convex at their apices and on the outer disk, nitidous, distantly impressed with fine punctures.

Chætocnema propinqua.

Anguste oblongo-ovata, convexa, nitida, subtus nigro-picea, pedibus sordide fulvis, femoribus posticis piceis, cupreo tinctis; supra piceo-cuprea aut cuprea; antennis piceis, basi fulvis; thorace profunde, subcrebre punctato, utrinque basi leviter impresso; elytris sat profunde punctato-striatis, striâ primâ minus regulariter punctatâ; interspatiis nitidis, ad apicem convexis, distincte, subremote punctatis, externis totis convexis.

Long. $1\frac{1}{3}$ lin. *Hab.*—South Australia, Adelaide.

Head trigonate; vertex and front rugulose, finely punctured, impressed on either side with four or five deep foveæ; interocular spaces separated from the front on each side by a deep flexuose groove; clypeus smooth, nearly impunctate, its apex broadly truncate, separated from the upper face by a deep transverse groove; its lower half, together with the parts of the mouth, piceous; antennæ about half the length of the body, the five lower joints fulvous, the rest piceous; the second joint moderately thickened, two-thirds the length of the first, the third equal in length to the second. Thorax nearly three times as broad as long; sides slightly rounded, converging towards the apex, the anterior angle obliquely truncate, produced laterally into a small, acute tooth; upper surface transversely convex, strongly and deeply punctured; on either side the basal margin, at some distance from the lateral border, is a small depression, which extends transversely inwards for a short distance towards the medial lobe. Elytra broader than the thorax, oblong, attenuated at the apex, convex, strongly and deeply punctate-striate,

Digitized by Google

the punctures much larger than those on the thorax; on the first stria they are less regularly placed than on the others; interspaces shining, finely but remotely punctured, convex behind the middle, thickened near the apex, those on the outer disk convex for their whole length; inflexed limb smooth and shining, impressed on the inner edge with a single row of punctures.

Chætocnema Waterhousei.

Elongata subparallela, convexa, nitida, subtus nigra, pedibus obscure fulvis, femoribus piceis, posticis cupreo tinctis; supra obscure cuprea, antennis fulvis, ad apicem leviter infuscatis; capite exserto, ruguloso; thorace crebre et profunde punctato; elytris thorace paullo latioribus, subparallelis, fortiter punctato-striatis, striâ primâ confusâ; interspatiis transversim granuloso-strigosis, convexis, externis subcostatis.

Long. 1 lin. *Hab.*—Western Australia; collected by Mr. Duboulay.

Head very similar in form to that of *C. megalopoides*, rather less exserted; vertex finely transversely rugulose; front rugulose-punctate, sparingly clothed with short griseous hairs; sutural grooves separating it from the interocular spaces, nearly obsolete, being only visible on their inner portion; apex of clypeus obtuse, separated from the front by a transverse groove; antennæ about half the length of the body, pale fulvous, six outer joints stained with fuscous; second joint thickened, more than half the length of the first, third distinctly shorter than the second. Thorax twice as broad as long; sides straight and parallel, anterior angles thickened, obliquely and narrowly truncate; upper surface transversely convex, deeply and closely punctured, rugulose on the sides; on either side, near the lateral margin, are a few short griseous hairs, similar to those on the front. Elytra scarcely broader than the thorax, narrowly oblong, sides subparallel; above moderately conxex, strongly punctate-striate, the punctures on the short stria next the suture irregularly placed; interspaces transversely granulose-strigose, distinctly convex, those near the outer margin subcostate.

Chætocnema laticeps.

Elongato-ovata, convexa, nitida, subtus nigro-picea, pedibus anticis quatuor pallidioribus, tibiis anticis, tarsis-

Digitized by Google

que anticis quatuor fulvis; supra cuprea, antennis fulvis; capite longitudine latiori, ruguloso; thorace profunde et crebre punctato, ad latera ruguloso; elytris fortiter punctato-striatis, striâ primâ totâ et striâ secundâ ante medium confusis; interspatiis nitidis, externis convexiusculis.

Long. 1 lin. *Hab.*—Western Australia.

Head rather broader than long; vertex and front rugose, punctate, impressed within the eyes with large round punctures; sutural grooves separating the front from the interocular spaces nearly obsolete; clypeus very short, piceous; antennæ rather more than half the length of the body, six outer joints stained with fuscous; basal joint nearly equal in length to the two following united, the second scarcely thickened, equal in length to the third. Thorax three times as broad as long; sides rounded and converging from the base to the middle, thence straight and very slightly converging to the apex, anterior angle thickened, its extreme apex obtuse; upper surface closely and deeply impressed with large round punctures; interspaces shining, rugulose on the sides. Elytra oblong-ovate, rather broader than the thorax; above convex, strongly punctate-striate, the punctures on the whole of the first stria, together with those on the anterior half of the second, confused; interspaces nitidous, convex towards the apex, those on the outer margin convex for their whole length.

The more ovate form, the broad head, short clypeus, differently-shaped thorax and the more confused punctuation at the inner base of the elytron, separate this species at once from *C. Waterhousei*.

Chætocnema laticollis.

Ovata, convexa, nigro-cuprea, nitida, antennis nigris, basi piceis; subtus nigra, pedibus piceo-æneis, tibiis tarsisque fulvo-piceis; capite magno, thoracem latitudine æquanti, lævissime ruguloso; thorace elytris fere æquilato, nitido, basi utrinque oblique impresso; disco lævissime ruguloso, tenuiter punctato, lateribus magis distincte punctatis, distincte rugulosis; elytris regulariter punctato-striatis, interspatiis planis, externis convexis. *Mas.*

Long. 1 lin. *Hab.*—Western Australia, Swan River.

Head large; vertex and front broad, slightly convex,

Digitized by Google

impunctate, finely rugulose; interocular spaces impressed with a few large round punctures, separated from the front on either side by an oblique flexuose groove, the lower end of which is connected with its fellow of the opposite side by the transverse groove separating the apex of the clypeus from the upper face; encarpæ and carina obsolete; clypeus short, very broad; labrum large, its anterior margin obtusely angulate; mandibles large; antennæ scarcely half the length of the body, five or six lower joints piceous, the rest black. Thorax nearly three times as broad as long; sides straight and parallel at the base, thence very slightly converging to the apex, the anterior angles produced laterally into a very short subacute tooth; middle third of apical margin slightly sinuate; above subcylindrical, impressed on either side at the base, with a shallow, slightly oblique, longitudinal groove, which extends upwards on the disk for a fourth of its length; surface very finely granulose-rugose, nitidous, finely punctured, the puncturing and rugosity more distinct on the sides. Elytra scarcely broader than the thorax at the base, attenuated from before the middle to the apex, convex, regularly and deeply punctate-striate; interspaces plane, convex on the outer disk, sparingly impressed with very minute punctures. Legs short, robust, basal joint of hinder tarsus dilated in the ♂.

Separated from *C. ænea*, Waterhouse, by its smoother head and thorax; from *nigro-ænea* of the same author, by the smoother thorax and by the basal thoracic grooves.

Chætocnema brevicornis.

Anguste ovata, convexa, nitida, subtus nigra, supra cuprea, pedibus antennisque rufo-fulvis, his extrorsum nigro-piceis, femoribus posticis cupreis; thorace granuloso, minute, subremote punctato; elytris ovalibus, sat tenuiter punctato-striatis, interspatiis planis, granulosis.

Long. 1 lin. *Hab.*—Western Australia.

Head subrotundate; vertex and front granulose, finely punctured; grooves separating the front from the interocular spaces distinct; clypeus plane, more coarsely punctured than the front, its apex broadly truncate; antennæ slender, much less than half the length of the body, rufo-fulvous at the base, the seven outer joints nigro-piceous. Thorax twice as broad as long; sides

Digitized by Google

parallel at the extreme base, thence rounded and converging to the apex, anterior angles thickened, obtuse; above convex, granulose, finely and subremotely punctured. Elytra soldered together at the suture, broader than the thorax, oval, truncate at the base; convex, regularly punctate-striate, the punctures shallow, but much larger than those on the thorax; interspaces plane, granulose.

Genus XENIDEA, Baly.

Xenidea Wallacei.

Anguste ovata, convexa, picea, nitida, pedibus anticis quatuor antennisque obscure fulvis; thorace minute, subcrebre punctato; elytris metallico-violaceis, piceo-tinctis, distincte punctato-striatis; interspatiis planis, externis convexiusculis.

Long. 1¾ lin. *Hab.*—Sulu Islands, New Guinea.

Head trigonate, scarcely longer than broad; vertex and front shining, impunctate; frontal grooves oblique, extending downwards from the upper margin of the eyes to the carina; the latter strongly raised, rather broader and less compressed than in *X. purpureipennis;* antennæ more than half the length of the body. Thorax twice as broad as long; sides straight, faintly bisinuate, anterior angles obliquely truncate; upper surface convex, finely but rather closely punctured. Elytra broader than the thorax, oblong-ovate, slightly attenuated towards the apex, distinctly punctate-striate, interspaces impunctate.

Xenidea purpureipennis.

Ovata, convexa, rufo-testacea, nitida, pleuris, tarsis tibiisque posticis piceis; antennis nigris, articulis basalibus fulvis, 9mo et 10mo flavo-albidis; femoribus posticis elytrisque metallico-purpureis; his regulariter punctato-striatis, interspatiis convexiusculis, ad latera et ad apicem convexis; thorace lævi, remote, tenuissime punctato.

Long. 2 lin. *Hab.*—New Guinea (Dorey).

Head triangular, not longer than broad; vertex and front smooth, impunctate; encarpæ obsolete; carina strongly raised, linear; frontal grooves bordering the upper half of the inner margin of the eye, then abruptly curving inwards, nearly at right angles, to the carina; antennæ slightly more than half the length of the body.

Digitized by Google

Thorax twice as broad as long; sides nearly straight, only very slightly rounded and slightly converging from base to apex, anterior angle obliquely truncate, produced laterally into a short acute tooth; upper surface smooth and shining, remotely impressed with very minute punctures. Elytra much broader than the thorax, convex, rather strongly punctate-striate; interspaces smooth, impunctate.

Genus EUPLECTROSCELIS, Crotch.

Homophyla, Harold.

Euplectroscelis Deyrollei.

Late ovata, convexa, pallide picea, nitida, capite piceo, vertice utrinque pone oculum nigro, antennis fulvis; thorace nigro-piceo, anguste marginato, tenuissime punctato, utrinque intra marginem longitudinaliter impresso; elytris tenuiter punctatis, punctis lineâque suturali nigro-piceis.

Long. 1½ lin. *Hab.*—Brazil.

Head triangular; vertex and front slightly swollen, shining, impunctate; encarpæ obsolete; carina well defined, rhomboidal; antennæ about half the length of the body, third joint nearly one-half longer than the second, the fourth one-half longer than the third. Thorax three times as broad as long; sides slightly rounded, obliquely converging from base to apex, anterior angles very obliquely truncate, obtuse; basal margin slightly oblique and bisinuate on either side, the medial lobe slightly produced, obtusely truncate; disk very finely punctured, on either side within the lateral margin is an ill-defined longitudinal depression. Scutellum not broader than long, semirotundate-ovate. Elytra broader than the thorax, attenuated near the apex, minutely punctured, the punctures, together with a narrow sutural line, nigro-piceous.

Euplectroscelis tibialis.

Ovato-rotundata, valde convexa, nigra, nitida, pedibus nigro-piceis, antennis sordide-fulvis, apice nigris; thorace subcrebre, tenuiter punctato, elytris subremote punctatis.

Mas.—Tibiis posticis valde incrassatis.

Long. 1½ lin. *Hab.*—Brazil, Bahia.

Head rotundate, vertex smooth, impunctate; encarpæ

Digitized by Google

raised, oblique, linear, separated by the apex of the carina, the latter raised, oblong; lower portion of clypeus and labrum piceous; antennæ three-fourths the length of the body, robust, obscure fulvous, three outer joints black; second and third joints equal in length, the fourth rather longer than the third. Thorax more than twice as broad as long; sides straight, quickly converging from base to apex, anterior angles oblique, thickened; basal margin bisinuate on either side, the medial lobe obtusely rounded; upper surface finely and rather closely punctured. Scutellum semirotundate. Elytra broader than the thorax, minutely and rather distantly punctured. Hinder tibia equal in length to the femur, compressed at the base, strongly thickened towards the apex, its upper surface flattened, slightly concave near the apex; basal joint of hinder tarsus dilated, subtrigonate. ♂.

Euplectroscelis bimaculata.

Rotundato-ovata, convexa, nitida, pallide rufo-picea, antennis, pedibus anticis quatuor tarsisque posticis obscure fulvis; vertice femoribusque posticis piceis; thorace minute punctato; elytris minute punctatis, nigro-piceis, utrisque plagâ rotundatâ prope medium positâ rufâ.

Long. 1¼ lin. *Hab.*—Brazil, Parana.

Head trigonate, not longer than broad; vertex and front slightly swollen, smooth, impunctate; encarpæ obsolete; carina strongly raised, linear; eyes large, ovate-rotundate; antennæ four-fifths the length of the body, filiform, apex of terminal joint emarginate. Thorax three times as broad as long; sides nearly straight, converging from base to apex, anterior angles obliquely truncate, thickened; basal margin bisinuate on either side, the medial lobe very obtusely rounded; upper surface finely punctured. Elytra finely punctured, the interspaces (when seen under a strong lens) covered with very fine irregular strigæ; hinder tibiæ robust.

Euplectroscelis placida.

Late ovata, convexa, pallide picea, nitida, pedibus antennisque fulvis, femoribus tibiisque posticis pallide piceis; vertice impunctato, obscuriori; thorace sat tenuiter punc-

Digitized by Google

tato; elytris distincte punctatis; tibiis posticis modice robustis.

Mas. Tibiæ anticæ articulo basali dilatato.

Long. 1 lin. *Hab.*—Brazil.

Head rotundate, vertex smooth, impunctate; encarpæ obsolete; carina broad, its apex angulate, slightly raised, ill-defined; antennæ nearly three-fourths the length of the body, second and third joints nearly equal, the fourth one-half longer than the third. Thorax three times as broad as long; sides nearly straight, converging from base to apex, anterior angle obliquely truncate, its outer edge produced slightly outwards; upper surface finely but not closely punctured. Elytra broader than the thorax, regularly rounded at the apex, distinctly punctured.

Euplectroscelis nigripennis.

Breviter ovata, valde convexa, fulva, nitida, thorace rufo-fulvo, lævi, minute punctato; elytris nigris, confuse, tenuiter punctatis.

Long. 1¼ lin. *Hab.*—Pará.

Head subtrigonate; vertex and front narrow, longitudinally convex, very finely punctured, the punctures only visible under a strong lens; encarpæ obsolete; carina narrow, elongate; eyes large; antennæ more than three-fourths the length of the body, fulvous, the terminal joint stained with piceous. Thorax twice as broad at the base as long; sides converging from base to apex, nearly straight, very slightly rounded; anterior angles obliquely truncate; impressed near the lower end with a large, round setiferous fovea; basal margin bisinuate on either side, medial lobe broadly and very obtusely rounded; upper surface nitidous, finely but not closely punctured. Scutellum piceous. Elytra much broader than the thorax, very convex, finely but rather more strongly punctured than the thorax; below the humeral callus are a few larger punctures; interspaces shining, impunctate. Hinder tibiæ equal in length to the femur, the outer surface broadly channelled for nearly its whole length.

Euplectroscelis sordida.

Late ovata, valde convexa, nitida, subtus fusca, pedibus

Digitized by Google

nigro-piceis; supra picea, antennis nigris; elytris fuscis, tenuiter punctatis, pone medium nigro-piceis.

Long. 2 lin. *Hab.*—Amazons.

Head triangular; vertex slightly thickened, very finely punctured; encarpæ obsolete; carina strongly raised, elongate; antennæ with the three lower joints pale piceous, the rest black; second joint short, ovate, the third slender, filiform, twice the length of the second, fourth equal in length to the third. Thorax more than twice as broad as long; sides straight and quickly converging from base to apex, slightly sinuate behind the anterior angle, the latter obliquely truncate; basal margin bisinuate on either side, medial lobe slightly produced, obtusely truncate; upper surface finely punctured. Elytra less closely punctured than the thorax. Hinder tibiæ nearly straight, slender at the base, gradually thickened towards the apex.

Genus MEGISTOPS, Boh.

Megistops ornatus.

Ovalis, convexus, pallide piceus, nitidus, capite, antennis extrorsum, femoribus posticis apice tarsisque, rufo-piceis; thorace crebre punctato, læviter ruguloso; elytris rufo-piceis, tenuiter, sat crebre punctatis, utrisque maculis duabus, primâ oblongâ, a basi fere ad medium extensâ, secundâ pone medium positâ, subrotundatâ, fulvis.

Long. $1\frac{2}{3}$ lin. *Hab.*—Amazons; Santarem.

Head exserted, rotundate; eyes large, contiguous; encarpæ well defined, transverse, contiguous; carina raised, elongate; antennæ half the length of the body, four lower joints pale piceous, the rest nigro-piceous. Thorax nearly three times as broad as long; sides converging from base to apex, nearly straight, anterior angles oblique, obtuse; above transversely convex, closely punctured, finely rugulose. Scutellum trigonate. Elytra much broader than the thorax, ovate, finely and closely rugulose-punctate, the puncturing less crowded towards the apex, the interstices on that portion of the elytron smoother and less distinctly rugulose.

Megistops pretiosus.

Anguste ovalis, fulvus, nitidus, capite pedibusque posticis piceo-fulvis; antennis, basi exceptis, nigris; thorace

Digitized by Google

crebre, tenuiter punctato, leviter ruguloso; elytris oblongis, lateribus sinuatis, tenuiter punctatis, piceis, limbo laterali piceo fulvo; utrisque plagis duabus, unâ oblongâ, paullo obliquâ, a basi prope suturam ad medium productâ, alterâ pone medium subrotundatâ, fulvis ornatis.

Long. $1\frac{2}{3}$ lin. *Hab.*—Venezuela.

Head exserted, eyes very large, contiguous; encarpæ well defined, transverse, contiguous; carina obsolete; antennæ about half the length of the body, black, three lower joints fulvous. Thorax three times as broad as long; sides converging and slightly rounded from base to apex, the anterior angles obtuse; upper surface punctured as in *M. ornatus*. Elytra broader than the thorax, narrowly oblong, sinuate on the sides, slightly attenuated towards the apex, punctured similarly to *M. ornatus*.

Digitized by Google

Digitized by Google

XXIII. *On the* Lepidoptera *of the Family* Lithosiidæ, *in the Collection of the British Museum.* By Arthur G. Butler, F.L.S., F.Z.S., &c.

[Read October 3rd, 1877.]

My object in the publication of the present paper is to make a list of the species of *Lithosiidæ* at present existing in the National Collection, at the same time correcting the numerous erroneous determinations, chiefly with reference to genera, in Mr. Walker's lists; in order to do this satisfactorily, I have continued my studies in the wing veining of the species, but chiefly confining myself to that of the secondaries, which has, to a great extent, enabled me satisfactorily to locate them in their proper genera.

Owing to the affinity which appears to exist between some of the smaller *Lithosiids* and some genera of *Tineites*, I feel some compunction in admitting them into this paper; still I think on the whole they are better where they are, unless they can be proved, by breeding, to belong to the *Hyponomeutidæ*; I refer to such genera as *Talara* and *Trichromia*, which seem not only allied to the *Lithosiid* genus *Cisthene*, but less closely to *Atteva* = *Corinea*, *Cydosia*, &c. of the *Hyponomeutidæ*.

The genus *Mæpha*, referred by Walker to the *Tineites*, appears to be allied to *Cisthene*.

Family LITHOSIIDÆ.

Chrysocale, *Walker* (restricted*). (Pl. VIII. figs. 1, 2.)

1. C. magnifica, Wlk. Lep. Het. Suppl. 1, p. 96. *Hab.*—Bogota.

This species has no structural points in common with the three forms of *Eupyra*, to which Walker first applied the generic name.

---

* This generic name cannot be retained as originally applied. I have, therefore, adopted it for *C. magnifica* only, using Walker's extension of the group.

Digitized by Google

ANTONA, *Walker*.

2. Antona subluna, Wlk. Lep. Het. 2, p. 480. *Hab.*—Rio Janeiro, Brazil.

This genus seems clearly to be allied to the preceding.

APISTOSIA, *Hübner*.

3. Apistosia judas, Hübn. Sml. Exot. Schm. Zutr. figs. 51, 52. *Hab.*—Honduras, Guatemala.

4. Apistosia terminalis, Wlk. Lep. Het. 2, p. 478. *Hab.*—Mexico.

A.? multifaria does not belong to this genus, but is = *Ctenucha rubroscapus*.

A.? umber of Cramer is an *Opharus*, a genus near *Halesidota*.

LERINA, *Walker*.

5. Lerina incarnata, Wlk. Lep. Het. 2, p. 477. *Hab.*—Mexico.

TUINA = ITUNA, *Walker* (nec *Doubleday*).

6. Tuina cingulata, Wlk. Lep. Het. 2, p. 481. *Hab.*—Honduras.

CISSURA, *Walker*.

7. Cissura decora, Wlk. Lep. Het. 2, p. 488.
Cratosia parallela, Felder, Reise der Nov. Lep. iv. pl. cvi. fig. 8. *Hab.*—Brazil.

HYPOPREPIA, *Hübner*.

8. Hypoprepia fucosa, Hübn. Sml. Exot. Schm. Zutr. figs. 471, 472. *Hab.*—N. America.

9. Hypoprepia vittata = Gnophria vittata, Harris. *Hab.*—N. America.

10. Hypoprepia miniata = Lithosia miniata, Kirby, F. B. A. iv. p. 305. *Hab.* — Canada, N. America.

Mr. Grote says (Proc. Ent. Soc. Phil. 1863, vol. ii. p. 31) that "*Lithosia miniata*, Kirby, and *Gnophria vittata*, Harris, are undoubtedly synonyms" of *H. fucosa*,

Digitized by Google

Hübn. The three forms chiefly differ in the width of the slaty black border of the secondaries, which attains its extreme width of half the wing in *H. vittata*, is narrower in *H. fucosa*, and in *H. miniata* is reduced to a slender and even interrupted marginal band, not encroaching upon the fringe. I cannot regard *H. fucosa* as congeneric with the smaller species subsequently associated with it, since the subcostal and median branches of the secondaries are emitted from footstalks beyond the end of the discoidal cell.

Cisthene, *Walker*.

11. Cisthene unifascia, Grote, Trans. Am. Ent. Soc. ii. p. 187, pl. ii. fig. 63 ♂. *Hab.*—Texas (*Belfrage*).

We have two examples, both having the apex of secondaries dark as in *C. subjecta;* they differ much in size and in the width of the transverse yellow band of primaries; still both differ from *C. subjecta* in having this band and the internal border uninterrupted, whereas in *C. subjecta* the band is always broken through and the inner border incloses a more or less pronounced internal blackish streak. Our smaller Texan form may be *C. tenuifascia.*

12. Cisthene subjecta, Wlk. Lep. Het. 2, p. 534. *Hab.*—United States.

We have two examples of what may be a variety of this species; they are rather longer in the primaries and have no transverse yellow band.

13. Cisthene minuta, n. sp. *Hab.* — Sta. Martha (*Bouchard*).

Allied to *C. subjecta;* primaries silver-grey, with a white interno-median streak from base to external angle; secondaries rose-red, the apex broadly and the outer margin narrowly brown; fringe grey; head and thorax whitish, abdomen rose-red; primaries below brown, with white interno-median streak; otherwise as above: expanse of wings 6 lines.

14. Cisthene hilaris, Felder, Reise der Nov. Lep. pl. cxxxix. fig. 3. *Hab.*—Venezuela (*Dyson*).

Digitized by Google

TRICHROMIA, *Hübner*.

15. Trichromia trigemmis, Hübn. Sml. Ex. Schm. Zutr. figs. 477, 478. *Hab.*—Espiritu Sancto.

Cisthene faustinula and *C. nexa* of Stretch much resemble this species.

16. Trichromia bipartita = Lycomorpha bipartita, Wlk. Lep. Het. Suppl. 5, p. 1871. *Hab.*—Pará.

17. Trichromia suspecta = Cisthene? suspecta, Felder, Reise der Nov. Lep. v. pl. cxxxviii. fig. 45. *Hab.*—Espiritu Sancto.

Felder's figure is not good, the band of primaries being broader and the ground-colour shot with blue.

18. Trichromia strigosa, n. sp. *Hab.*—Espiritu Sancto.

Primaries ochre-yellow, becoming blackish towards the outer margin; a longitudinal black streak through the centre of the lower discoidal interspace; secondaries ashy-grey; head and thorax ochre-yellow, with a lateral brown streak bounding the inner margins of the tegulæ; abdomen ashy-grey; antennæ black; under surface brown; primaries with a subcostal ochreous streak from base to just beyond the cell: expanse of wings 8 lines.

Not nearly allied to any species known to me.

MÆPHA, *Walker*.

19. Mæpha opulentana, Wlk. Lep. Het. 30, p. 1014. *Hab.*—Ega and Espiritu Sancto.

20. Mæpha variegata = Cisthene variegata, Wlk. Lep. Het. 31, p. 242. *Hab.*—Ega.

21. Mæpha plicata, n. sp. *Hab.*—Espiritu Sancto.

Primaries above shining golden, the costa apparently folded back and fringed, owing to the presence of a ridge of dense upright scales through the cell and joining an oblique fold from the end of the cell to the costa near apex; veins, and two transverse parallel lines (interrupted by the discoidal ridge), shining purple; a scarlet spot beyond the end of the cell; fringe brown; secondaries vermillion, with the apex black; head and thorax golden

Digitized by Google

yellow, margined with black; antennæ black; abdomen red; wings below red; primaries with the costal and inner borders testaceous; a central black costal line, and a subcostal line below it, both black, their outer extremities partially connected by brown scales; apical and external borders broadly brown, crossed by darker veins; secondaries as above excepting that the costa is yellowish; body below shining golden; the legs with silvery coxæ and femora, and purple streaked femora and tibiæ; expanse of wings 8½ lines.

Allied to the preceding species.

22. Mæpha sesapina, n. sp. *Hab.*—Espiritu Sancto.

Primaries above ochre-yellow, crossed in the centre by two irregular dark brown lines, the outer line zigzag; the basal and discal areas with dark brown dashes along the veins; outer margin slenderly brown, fringe tipped with whitish; secondaries rosy, the apex and fringe greyish; head and thorax ochre-yellow; a central longitudinal blackish line through the head and collar; antennæ brown, tipped with white; abdomen rosy; wings below rosy; primaries with the costal and external areas yellowish; brown markings less distinct than above; two large dusky costal blotches; secondaries with the costa yellowish; a dusky spot at apex; body below yellow: expanse of wings 7 lines.

Allied to the preceding species; the primaries marked like *Sesapa.*

Talara, *Walker.*

23. Talara megaspila, Wlk. Lep. Het. Suppl. 5, p. 1891.
Hab.—Ega.

24. Talara coccinea, n. sp. *Hab.*—Villa Nova.

Primaries above scarlet, the apical two-thirds of costa yellowish; a black oval costal spot just beyond the cell; fringe stramineous, dusky at the base excepting at apex and external angle; secondaries smoky brown, rosy at the base; costa and fringe white; head and thorax scarlet; antennæ, excepting at the base, black; abdomen brown; wings below brown, the base rosy; primaries with the costa rosy towards the base and ochraceous towards the apex; a blackish costal dash beyond the cell; fringe whitish; body below brown, the palpi, coxæ and femora scarlet, the tarsi white: expanse of wings 9 lines.

Digitized by Google

GERBA, *Walker*.

25. Gerba quadrifasciata, Wlk. Lep. Het. Suppl. 1, p. 270. *Hab.*—Oaxaca.

Scarcely generically distinct from *Ruscino*.

RUSCINO, *Walker*.

26. Ruscino arctifascia, n. sp.

Ruscino menea, Wlk. (nec Drury), Lep. Het. 2, p. 564. *Hab.*—Honduras.

27. Ruscino latifasciatus, Butler, Ann. & Mag. S. 4, vol. xv. p. 341. *Hab.*—Veragua.

28. Ruscino lætifera, Wlk. Lep. Het. Suppl. 1, p. 264. *Hab.*—Mexico.

This species differs from the preceding in the greyer tint of the primaries, the more regular transverse band, and the somewhat narrower black border of the secondaries.

29. Ruscino lunaris = Cisthene lunaris, Wlk. Lep. Het. Suppl. 1, p. 241. *Hab.*—Bogota and Yucatan.

29*. Ruscino menea, Drury, Ill. Nat. Hist. 3, pl. iii. fig. 2. *Hab.*—Brazil (*Drury*).

The five preceding forms are all local modifications of one type, chiefly differing in the width of the yellow bands of primaries and of the black border of secondaries.

30. Ruscino basalis = Nelo basalis, Wlk. Lep. Het. Suppl. 1, p. 184. *Hab.*—Bogota.

Chiefly differs from the preceding species in its smaller size, and the absence of the submarginal band of primaries. There are, however, other less striking distinctions.

EUDESMIA, *Hübner*.

31. Eudesmia ruficollis, Hübn. Sml. Exot. Schm. 2, figs. 1—4. *Hab.*—Brazil.

This species differs but little from the genus *Ruscino* in structure. *L. mina* of Guérin appears to be congeneric.

BRYCEA, *Walker*.

32. Brycea disjuncta, Wlk. Lep. Het. 2, p. 563. *Hab.* —Brazil.

Digitized by Google

33. Brycea trisigna = Cisthene trisigna, Wlk. Lep. Het. 2, p. 534. *Hab.*—Venezuela.

34. Brycea transcisa = Phæochlena transcisa, Wlk. Lep. Het. 2, p. 468. *Hab.*—Brazil.

Walker need not have omitted the locality of this species; it is noted in the Register.

JOSIOIDES, *Felder.* (Pl. VIII. fig. 8.)

35. Josioides myrrha, Cramer, Pap. Exot. 1, pl. xxix. fig. C 1. *Hab.*—Pará.

This species is referred by Hübner to *Ephestris* and by Walker to *Chrysango*; the latter author also describes it under the name of *Josia repleta*.

36. Josioides abscissa, Hübn. Sml. Exot. Schm. 1, figs. 1—4. *Hab.*—Pará.

Three or four distinct things were associated by Walker under this name, and the true *J. abscissa* described as a variety of *J. repleta*.

37. Josioides immutata = Josia immutata, Wlk. Lep. Het. 2, p. 300. *Hab.*—Brazil.

38. Josioides fallax, n. sp. *Hab.*—Brazil.

Primaries above black; an increasing broad ochre-yellow streak from the base to near the external angle, its edges sharply cut, not angulated but rounded, traversing the median vein and enclosing the greater part of its first two branches; a subapical oblique abbreviated stripe of the same colour; secondaries black, the central area occupied by a broad increasing streak of ochre-yellow, which terminates just before the middle of the outer margin; base and abdominal margin of the same colour; body olivaceous brown, with the tegulæ and sides of abdomen ochreous; antennæ black; wings below nearly as above; body silky greyish-brown: expanse of wings 1 inch 4—7 lines.

Allied to the preceding species, with which Mr. Walker confounded it; the much narrower ochreous areas of both primaries and secondaries readily distinguish it.

39. Josioides variana, *Walker in MS.* *Hab.*—Pará.

Primaries orange; the base, borders and an oblique subapical belt connecting the costa with the outer border, black; secondaries black, the cell being covered by a sub-

Digitized by Google

cuneiform patch of orange; abdominal margin ochreous; body blue-black, with an orange stripe on each side of the abdomen; below almost as above: expanse of wings 1 inch, 6–7 lines.

40. Josioides indecisa, n. sp. *Hab.*—Pará.

Nearly allied to the preceding, but the orange area of the primaries extended to the costal margin in the centre, and enclosing an oblong black spot above the submedian vein; secondaries with a costal orange streak parallel to the discoidal one, and connected with it at its inferior extremity by a few orange scales, on the under surface only separated from it at the base by a short black dash: expanse of wings 1 inch 6 lines.

Possibly a variation of *J. variana*.

41. Josioides sexmaculata, Butler, Ill. Lep. Het. pl. xix. fig. 4. *Hab.*—Pará.

42. Josioides inconstans, n. sp. *Hab.*—Pará.

Allied to the preceding, but the orange area of the primaries continued to the base, with a short squamose dash above the submedian vein; secondaries wholly black on the upper surface: expanse of wings 1 inch 6 lines.

This may, perhaps, be a variety of the preceding species; but the whole of the species differ from each other in about equal degrees, so that a gradation exists from one end of the genus to the other.

43. Josioides fixa = Josia fixa, Wlk. Lep. Het. 2, p. 295. *Hab.*—Pará.

44. Josioides mutata = Josia mutata, Wlk. Lep. Het. 2, p. 296. *Hab.*—Pará.

J. Batesii of Felder is intermediate between this and the next species.

45. Josioides generans = Josia generans, Wlk. Lep. Het. 2, p. 296. *Hab.*—Pará.

46. Josioides obscura, n. sp. *Hab.*—Pará.

Wings above purplish-brown; primaries with a narrow oblique patch of orange across the median vein and its first branch; a subapical orange spot; body brown with a greyish tint; primaries below with the orange patch enlarged into a broad, quadrangular, almost wedge-shaped

Digitized by Google

blotch; subapical spot larger and lunate; otherwise as above: expanse of wings 1 inch 2 lines.

Readily distinguished from *J. generans* by the orange patch of primaries being much smaller on the upper and considerably larger on the lower surface.

47. Josioides erythromelas = Josia erythromelas, Wlk. Lep. Het. 2, p. 297. *Hab.*—Pará.

48. Josioides celena = Josia celena, Wlk. Lep. Het. 2, p. 297. *Hab.*—Amazons.

49. Josioides trajecta = Scedrosa trajecta, Wlk. Lep. Het. Suppl. 1, p. 138. *Hab.*—Ega.

Scarcely distinct from the preceding.

50. Josioides purpurata, Butler, Ill. Lep. Het. 1, pl. xix. fig. 5. *Hab.*—Barreiras das Araras, Upper Amazons.

51. Josioides clavata = Josia clavata, Wlk. Lep. Het. 2, p. 297. *Hab.*—Pará.

52. Josioides mutans = Josia mutans, Wlk. Lep. Het. 2, p. 296. *Hab.*—Pará.

The above genus represents one of those ever-increasing instances among the Lepidoptera in which it is impossible to say which of the forms are species and which varieties; as will be seen, the bulk of them occur at Pará.

Byrsia, *Walker.*

53. Byrsia dotata, Wlk. Lep. Het. Supp. 1, p. 193. *Hab.*—Timor.

Pallene, *Walker.*

54. Pallene structa, Wlk. Lep. Het. 2, p. 543. *Hab.*—Sydney.

55. Pallene jucunda, Wlk. Lep. Het. 2, p. 543. *Hab.*—Sydney, Moreton Bay.

Tospitis transitana, Wlk. l. c. 28, p. 430.

56. Pallene transversa = Cyllene transversa, Wlk. Lep. Het. 2, p. 544. *Hab.*—Ceylon.

Digitized by Google

57. Pallene aspectalella = Œcophora aspectalella, Wlk. Lep. Het. 19, p. 679.
Tinea œcophorella, Wlk. Lep. Het. Suppl. 5, p. 1813. *Hab.*—Sydney and Moreton Bay.
The short palpi of this species ought to have prevented its being described as an *Œcophora*.

58. Pallene elegans, n. sp. *Hab.*—Australia.
Primaries above chocolate-brown; a broad basal belt or patch, transverse constricted band beyond the middle, interrupted in the centre so that it forms two opposed conical spots, and the costal margin at apex, creamy-whitish with blackish borders; fringe grey, minutely spotted with ochreous; secondaries pale ochreous, the fringe darker; apex greyish; head and collar white; antennæ dusty greyish; thorax dark brown; abdomen testaceous; primaries below paler than above; body ochraceous: expanse of wings 9 lines.

TERMESSA, *Walker*.

59. Termessa discrepans, Wlk. Lep. Het. Suppl. 1, p. 265. *Hab.*—Australia.

60. Termessa hamula, Felder, Reise der Nov. Lep. iv. pl. cvi. fig. 5. *Hab.*—Australia.
Near the preceding, but with the primaries ochreous instead of milky white.

61. Termessa congrua, Wlk. Lep. Het. Suppl. 1, p. 265. *Hab.*—Moreton Bay.

62. Termessa læta, Wlk. Lep. Het. 7, p. 1689. *Hab.* —Sydney.

63. Termessa shepherdi, Newman, Tr. Ent. Soc. Lond. 1856. *Hab.*—Tasmania.
Larger and coarser than the preceding, the black belts of primaries broader and the irregular external whitish stripe broken up; the spots of secondaries larger, no spot on the outer margin.

EUTANE, *Walker*.

64. Eutane gratiosa, Wlk. Lep. Het. Suppl. 1, p. 239. *Hab.*—Australia.
E. tineoides of Felder is allied to this species.

Digitized by Google

65. Eutane maculata, n. sp. *Hab.*—Australia.

Primaries above chocolate-brown; a large spot near the base, two rounded spots of the same size just beyond, then an irregular postmedian transverse band, and lastly three submarginal conical spots (the two uppermost of which are externally confluent), creamy-whitish; secondaries pale-ochreous, with a rather broad brown outer border; body dark brown, frons whitish, collar and shoulders spotted with ochreous, anus ochreous; below nearly as above, but the primaries less distinctly marked, and the secondaries with two yellow dots towards the apex of the outer margin: expanse of wings 1 inch 2 lines.

Allied to the succeeding species, but larger; the spots of primaries larger and cream-coloured instead of ochreous, and the border of secondaries narrower.

66. Eutane terminalis, Wlk. Lep. Het. 2, p. 531. *Hab.* —New South Wales.

67. Eutane Lydia, Donovan, Ins. New Holland, pl. xl. fig. 1.

Asura gaudens, Wlk. Lep. Het. 2, p. 485. *Hab.* —Australia.

Readily distinguished from the preceding species by the presence of a fourth large spot before the postmedian band of primaries, and frequently by the existence of an oblique black bar across the middle of the secondaries.

LEMYRA, *Walker*. (Pl. VIII. fig. 14.)

68. Lemyra extensa, Wlk. Lep. Het. 7, p. 1690. *Hab.* —Celebes.

ASURA, *Walker*.

69. Asura cervicalis Wlk. Lep. Het. 2, p. 484. *Hab.* Australia.

I have not seen the Tasmanian example mentioned by Walker.

NEPITA, *Moore*.

70. Nepita anila, Moore, Cat. Lep. E. I. C. ii. p. 302. *Hab.*—Bengal.

Pitane lydia, var. Walker (nec Donovan), Lep. Het. 2, p. 532.

Digitized by Google

71. Nepita ægrota, n. sp. *Hab.*—India.

♂, ♀ larger than the preceding, the spots of primaries more sharply defined; secondaries whitish, with broader external black border than in *N. anila*, and a greyish streak from the abdominal margin just above the border; spots on the head and thorax larger, margins of abdomen narrower.

72. Nepita conferta = Pitane conferta, Wlk. Lep. Het. 2, p. 533. *Hab.*—Ceylon.
Nepita signata, Wlk. Lep. Het. Suppl. 1, p. 240.

73. Nepita ochracea, n. sp. *Hab.*—South India.

Primaries with the bands and spots of ochreous wider and of a brighter tint than in the three preceding species; so that instead of being black-brown banded with pale or dark ochreous, they are rather bright ochreous banded with black-brown; secondaries with a broad black-brown border, sometimes covering the greater part of the wing: expanse of wings 1 inch.

74. Nepita limbata, n. sp. *Hab.*—North India.

Primaries with the pattern of *N. anila*, but the ochreous bands considerably wider; secondaries with the dark-brown border slightly narrower and marked (on the first medium interspace) with a conical squamose submarginal spot; abdomen with wider ochreous border: expanse of wings, 11 lines.

We have two examples of this species.

75. Nepita semifascia = Setina semifascia, Wlk. Lep. Het. 2, p. 521. *Hab.*—Ceylon.

Allied to the preceding species, paler and less heavily marked.

76. Nepita bizonoides = Lyclene bizonoides, Wlk. Journ. Linn. Soc. vi. p. 111; Lep. Het. Suppl. 1, p. 246. *Hab.*—Sarawak.

Primaries creamy, but with similar markings to the preceding; secondaries white.

77. Nepita diffusa = Lyclene diffusa, Wlk. Journ. Linn. Soc. vi. p. 111; Lep. Het. Suppl. 1, p. 246. *Hab.*—Sarawak.

Darker portions of the primaries clearly defined, reddish in this species.

Digitized by Google

78. Nepita hilaris = Doliche hilaris, Wlk. Lep. Het. 2, p. 530. *Hab.*—Ceylon.

Pattern almost precisely as in *N. diffusa*, but the darker portions of the primaries deep reddish-brown.

79. Nepita frigida = Doliche frigida, Wlk. Lep. Het. 2, p. 530. *Hab.*—Moulmein and Sarawak.

Markings of the primaries partially confluent, and consequently confused.

The above genus contains a number of species in which the pattern of the primaries is chiefly modified by the relative width of the spots and bands and their interspaces; and the pattern of the secondaries, by the width or absence of the blackish outer border: so far as the Museum collection is concerned the species may be arbitrarily divided into six ochraceous, and four white species; but *N. semifascia*, being very pale, with almost white secondaries, is in reality a complete link between the two groups.

A small *Lithosiid* genus represented at Surinam and on the Rio Jutahi much resembles *N. frigida* in coloration, and is evidently allied to it and the following group. It will be shortly described by Dr. Möschler in his paper on the Lepidoptera of Surinam.

Cyana, *Walker*.

80. Cyana detrita, Wlk. Lep. Het. 2, p. 529. *Hab.*—Silhet.

Doliche, *Walker*.

81. Doliche gelida, Wlk. Lep. Het. 2, p. 529. *Hab.*—Silhet.

Bizone, *Walker*. (Pl. VIII. fig. 15.)

82. Bizone divakara, Moore, Proc. Zool. Soc. 1865, pl. xlii. fig. 9. *Hab.*—Darjeeling.

B. gazella of Moore, Proc. Zool. Soc. 1872, pl. xxxiii. fig. 4, is a similarly coloured species, although with a different pattern; *B. arama* of Moore's Catalogue is nearer to the next species.

83. Bizone conclusa, Wlk. Journ. Linn. Soc. vi. p. 120; Lep. Het. Suppl. 1, p. 261. *Hab.*—Sarawak.

B. costifimbria seems allied to this species.

Digitized by Google

84. Bizone inconclusa, Wlk. Journ. Linn. Soc. vi. p. 120; Lep. Het. Suppl. 1, p. 261. *Hab.*—Sarawak.

85. Bizone hamata, Wlk. Lep. Het. 2, p. 549. *Hab.*—Shanghai.

We have also two examples of what is probably the female of this species from Hong-Kong.

86. Bizone javanica, n. sp.

Bizone puella, Moore (nec Drury), Cat. Lep. E. I. C. p. 305, pl. xiii. figs. 13, 13*a*. *Hab.*—Java (*Horsfield*).

Differs from *B. puella* in the more oblique and zigzag heavily black-edged scarlet bands of primaries. *B. determinata* of Walker, from Borneo, is evidently an allied species. Is it *B. perornata?*

87. Bizone puella, Drury, Ins. Exot. ii. p. 3, pl. ii. fig. 2. *Hab.*—Nepal.

88. Bizone peregrina, Wlk. Lep. Het. 2, p. 551. *Hab.*—Ceylon and South India.

Walker's Nepal example is identical with the preceding species.

B. bianca appears to be *B. peregrina* from the description.

89. Bizone pallens, n. sp. *Hab.*—Moulmein, Silhet, North India.

Paler than the preceding (with which Walker confounded it); the red bands of primaries much narrower and without black edges; the secondaries whitish at the base: expanse of wings 1 inch 1 line.

90. Bizone perversa, n. sp. *Hab.*—Sarawak.

Nearly allied to *B. pudens* of Walker, but easily distinguished by the third band from the base in primaries being strongly elbowed (instead of gradually slanting outwards to meet the marginal band), in the two lower scarlet spots being placed in a line with the third spot above them (instead of forming a nearly rectangled triangle), and in the deeper rosy-tinted secondaries: expanse of wings 9 lines.

Digitized by Google

91. Bizone pudens, Wlk. Journ. Linn. Soc. vi. p. 120; Lep. Het. Suppl. 1, p. 261. *Hab.*—Sarawak.

92. Bizone amabilis, Moore, Proc. Zool. Soc. 1877. *Hab.*—Andamans.

93. Bizone sanguinea, Bremer & Grey, Fauna des Nordl. China's, p. 14. *Hab.*—Mongolia.

94. Bizone subornata, Wlk. Lep. Het. 2, p. 550. *Hab.* —Ceylon.

95. Bizone pitana, Moore, Cat. Lep. E. I. C. p. 305. *Hab.*—Java (*Horsfield*).

96. Bizone perornata, Wlk. Lep. Het. 2, p. 548. *Hab.* —Silhet, Sarawak, Java.
I place this species here because of its pale secondaries.

97. Bizone delicata, Wlk. Lep. Het. 2, p. 550. *Hab.*— Sierra Leone.

98. Bizone signa, Wlk. Lep. Het. 2, p. 550. *Hab.*— Silhet.
Bizone adita of Moore is allied to this species, and I suspect *B. fasciculata* to be the male of *B. adita*.

99. Bizone guttifera, Wlk. Lep. Het. 7, p. 1779. *Hab.*— Landoor.

100. Bizone emergens, Wlk. Lep. Het. Suppl. 1, p. 261. *Hab.*—Hong-Kong.

101. Bizone effracta = Barsine effracta, Wlk. Lep. Het. 2, p. 546. *Hab.*—Nepal.

102. Bizone amatura, Wlk. Proc. Zool. Soc. 1863, p. 167. *Hab.*—Madagascar.

103. Bizone alborosea = Lithosea alborosea, Wlk. Lep. Het. Suppl. 1, p. 230. *Hab.*—North India.
B. impunctata of Felder is allied to this species.

Digitized by Google

MILTOCHRISTA, *Hübner*.

Section LYCLENE, *Moore*.

104. Lyclene humilis = Cyllene humilis, Wlk. Lep. Het. 2, p. 544. *Hab.*—Moulmein.

105. Lyclene congerens = Cymella congerens, Felder, Reise der Nov. Lep. iv. pl. cvi. fig. 14. *Hab.*—North India.

106. Lyclene nubifascia = Barsine nubifascia, Wlk. Lep. Het. Suppl. 1, p. 251.
Barsine punctifascia, Wlk. Char. Het. Lep. p. 9, n. 13 (1869). *Hab.*—Sikkim.
Chiefly differs from the two preceding species in its greater size; the general character of the coloration and pattern is the same.

Section BARSINE, *Walker*.

107. Barsine defecta, Wlk. Cat. Lep. Het. 2, p. 546. *Hab.*—Nepal.
Entirely distinct from *B. cuneonotatus*.

108. Barsine striata = Lithosia? striata, Bremer & Grey, Fauna des Nordl. China's, p. 14. *Hab.*—North China.
Allied to the preceding species.

109. Barsine mactans, n. sp. *Hab.*—Darjeeling.
Primaries scarlet, veins for the most part yellow; the base of costal margin, an elbowed transverse line near the base, a central transverse series of spots upon a yellow line, and a widely sinuated discal line emitting longitudinal streaks externally along the veins, mouse-grey; secondaries pale rose colour, with whitish fringe; thorax red, abdomen rose colour; under surface rose colour: expanse of wings, 1 inch 3 lines.
Allied to *B. defecta* of Walker and *B. gratiosa* of Guérin.

110. Barsine cruciata = Hypoprepia cruciata, Wlk. Journ. Linn. Soc. vi. p. 101. *Hab.*—Sarawak.

111. Barsine exclusa, n. sp. *Hab.*—Sarawak.
Primaries rose-red, with grey bands and spots; the

Digitized by Google

bands three in number, separated at internal margin; but uniting at the median vein and its branches so as to form ⋚X in conjunction; a small spot at the end of the cell, and a series of spots across the disc, the uppermost of which unite to form a second ⋚ marking; fringe black; secondaries rosy-whitish; thorax ochraceous, spotted with grey; abdomen whitish, the anus yellow, legs below scarlet: expanse of wings 10 lines.

Most nearly allied to the following.

112. Barsine trivittata, Moore, Proc. Zool. Soc. 1877.
Hab.—Andamans.

113. Barsine natalensis, Wlk. Lep. Het. Suppl. 1, p. 250.
Hab.—Natal.

The type is a mere fragment, and as it was unnamed in the supplementary drawers, it is a wonder that I discovered it; the description is bad; I therefore re-describe from a fresh example.

Above entirely ochreous: primaries crossed by three greyish-brown bands, the first (near the base) irregularly angulated, the second bisinuate, almost touching the first band at the angle between the sinuations, the third band irregularly sigmoidal, touching the lower portion of the second band; two black dots, immediately followed by two brown dashes at the base; a lunate discocellular black litura (Walker's "*ringlet*"); a semiconnected discal series of unequal greyish-brown spots, the inner margins of which are produced in many cases so as to unite them to the third band; fringe black; secondaries with the fringe black at apex (not more "fawn coloured" than the rest of the wing); head with a black spot on the crest; two black spots on the thorax, and two on each tegula; legs with the knees and end of tibiæ black (fore tibiæ *not* wholly black): expanse of wings 1 inch.

Section AMMATHO, *Walker*.

114. Ammatho roseororatus, n. sp. *Hab.*—Sarawak.

Allied to *B. cuneonotatus*, the grey bands of primaries arranged in the same way, forming CX above the median vein, and followed by a discal series of longitudinal grey streaks, but the whole wing suffused with rose-red, leaving

Digitized by Google

no abruptly clear yellowish patches either through the centre of the wing or on the outer border; the thorax also uniformly reddish, with grey spots: expanse of wings 1 inch 7 lines.

Notwithstanding the almost complete agreement of the markings, I cannot regard this as identical with the next species.

115. Ammatho cuneonotatus, Wlk. Lep. Het. 3, p. 759.
Hab.—Ceylon and Sarawak.

The Bornean example agrees with *A. roseororatus* in having the grey discal streaks separate instead of confounded together.

116. Ammatho rubricostata = Hypocrita rubricostata, Herrich-Sch. Exot. Lep. fig. 439.
Hypoprepia rubrigutta, Wlk. Journ. Linn. Soc. vi. p. 101. *Hab.*—Sarawak.

117. Ammatho delineata = Hypoprepia delineata, Wlk. Lep. Het. 2, p. 487.
Ammatho figuratus, Wlk. Lep. Het. 3, p. 759.
Hab.—Shanghai, N. China, Hong Kong.

I think it doubtful whether Herrich-Schäffer's *Hypocrita rhodina* from Borneo is the same species; it appears to be smaller, more distinctly marked, and with the apical nervular striæ of secondaries united into a grey patch. *Cyme chinensis* of Felder is, I should say, undoubtedly the same.

118. Ammatho carnipicta, n. sp. *Hab.*—Mongolia.

Primaries rose-red, with slender transverse greyish-brown lines, discal striæ and discocellular blackish dot, nearly as in *A. rhodina* (H.-Sch. Exot. fig. 438), but the lines more slender, that nearest the base sickle-shaped, not E shaped, the outer of the two central lines also more inarched below the median branches; fringe greyish-brown; secondaries paler; fringe whitish, sordid at apex; body sordid whitish, slightly rosy at the sides; primaries below with the whole central area suffused with greyish-brown; secondaries with a discocellular blackish spot; two abbreviated brownish diffused transverse central lines; veins at apex brownish; pectus and coxæ white: expanse of wings 1 inch.

Digitized by Google

119. Ammatho lineatus, Wlk. Lep. Het. 3, p. 760. *Hab.*—Sumatra.

120. Ammatho fuscescens, n. sp. *Hab.*—Mongolia and Shanghai.

Primaries sericeous greyish-brown; base streaked with rose-red; a trigonate subcostal spot, a dot (sometimes wanting) below the origin of the first median branch, and a conical spot on inner margin, scarlet; a diffused indistinct pinky testaceous nebula across the end of the cell; a brown-speckled interrupted rosy submarginal band, its inner edge zigzag; fringe blackish; secondaries pink, the nervures at apex covered by fusiform brown spots; a submarginal black line; fringe sordid whitish at anal angle, but becoming blackish towards apex; body rose-red, the head and thorax much deeper and brighter than the abdomen; wings below pink, becoming carmine on costa of primaries; all the wings with a large apical sericeous dark-grey blotch; fringe the same colour; pectus bright rose-red; venter sericeous brown, the basal segment, edges of the remaining segments and anus pink: expanse of wings 1 inch 1—2 lines.

Allied to *A. delineata.*

121. Ammatho placens = Barsine placens, Wlk. Lep. Het. Suppl. 1, p. 251. *Hab.*—Timor and Ceram.

Somewhat the aspect of *A. cuneonotatus.*

122. Ammatho euprepioides = Hypoprepia euprepioides, Wlk. Journ. Linn. Soc. vi. p. 102.

Hypocrita inclusa, Snellen, Tijd. voor Ent. 1877, pl. v. fig. 2. *Hab.*—Sarawak.

Nearly allied to the preceding species.

123. Ammatho distributa = Lyclene distributa, Wlk. Journ. Linn. Soc. vi. p. 113. *Hab.*—Sarawak.

124. Ammatho hieroglyphica, n. sp. *Hab.*—Sarawak.

Wings above dark brown; primaries with two pyriform basal spots, two elongated subcostal spots (the outermost one much the larger), an elongated median longitudinal streak, a trigonate internal elongated spot below it, and a transverse elongated submarginal bar, sulphur-yellow;

Digitized by Google

secondaries with a basi-costal streak and a central oval spot below it, sulphur-yellow; thorax spotted and abdomen narrowly banded with yellow; wings below with the yellow markings clearer, pale stramineous, secondaries with an oval subapical spot; body below pale yellow: expanse of wings 9 lines.

Cyme? orbicularis of Felder is a nearly allied species.

Section SESAPA, *Walker*.*

125. Sesapa inscripta, Wlk. Lep. Het. 2, p. 547. *Hab.* —North China.

126. Sesapa excurrens, Wlk. Lep. Het. Suppl. 1, p. 255. *Hab.*—Sikkim.

127. Sesapa lutara = Lyclene lutara, Moore, Cat. Lep. E. I. C. ii. p. 300. *Hab.*—Java.

128. Sesapa cuneigera = Lyclene cuneigera, Wlk. Journ. Linn. Soc. vi. p. 113. *Hab.*—Sarawak.

I believe *S. cuneifera* to be a male variety of this species.

129. Sesapa undulosa = Cyllene undulosa, Wlk. Lep. Het. 2, p. 545. *Hab.*—Moulmein.

130. Sesapa complicata, n. sp. *Hab.*—Sarawak.

Primaries ochreous; two black dots at the base, followed by four brown dashes; the basal area enclosed by two very irregular transverse brown lines, the outer one angulated, indistinct towards costal and inner margins; a blackish discocellular spot, touching a deeply-dentated discal line; a submarginal series of about a dozen brown spots; fringe dotted with brown; secondaries much paler, with a greyish discal diffused band; head and thorax ochreous, spotted with dark brown, abdomen paler; primaries below with all the markings blurred: expanse of wings 10 lines.

Allied to *S. cuneigera*.

131. Sesapa rivulosa = Siccia rivulosa, Wlk. Lep. Het. 2, p. 540. *Hab.*—Caffraria; Natal.

* This group most nearly agrees with typical *Miltochrista* in pattern.

Digitized by Google

132. Sesapa andamana, Moore, Proc. Zool. Soc. 1877. *Hab.*—Andamans.

133. Sesapa ichorina, n. sp. *Hab.*—Natal.
Primaries chrome-yellow, crossed by bands and spots as in *S. rivulosa*, but grey instead of brown, and bordered with red; secondaries whitish, with a feeble pinky tint; body chrome-yellow; wings below pink; primaries with a lilac tint, and with yellow borders; secondaries whitish, the costa and veins yellowish: expanse of wings 9 lines.

134. Sesapa rhodophila = Barsine rhodophila, Wlk. Lep. Het. Suppl. 1, p. 254. *Hab.*—Shanghai and Mongolia.

135. Sesapa (Miltochrista) sinica, Moore, Ann. and Mag. Nat. Hist. s. iv. vol. xx. p. 87. *Hab.*—Mongolia and North China.
Like *S. strigipennis* (H.-Sch. Exot. fig. 437), excepting that the primaries are rosy, with the black lines on the disc farther from the outer margin; secondaries tinted with rosy towards the costa, with a subapical grey spot.

136. Sesapa strigipennis, Herr.-Sch. Lep. Exot. fig. 437. *Barsine circumdata*, Wlk. Lep. Het. Suppl. 1, p. 252. *Hab.*—Sarawak.
I am satisfied, from the absolute agreement between our example and Herrich-Schäffer's figure, that the type of *S. strigipennis* came from Borneo and not from Australia.

137. Sesapa divisa, Wlk. Journ. Linn. Soc. vi. p. 102. *Hab.*—Sarawak.
Considerably larger than *S. circumdata*, with the basal streaks of primaries perfectly parallel, and the central transverse line zigzag or undulated.

138. Sesapa erubescens, n. sp. *Hab.*—North China.
Primaries above vermillion-red, fringe brown; the outer margin, a transverse nearly straight line just before the middle, an oblique elongated spot at the end of the cell, a deeply-indented and irregular transverse discal line, and nine or ten elongated disco-submarginal dots, black; secondaries dark brown; the costa and base irrorated with scarlet; thorax vermillion; abdomen wanting (pro-

Digitized by Google

bably brown): wings below vermillion; fringe brown; primaries with a submarginal series of black spots, confluent towards the costa; secondaries with a moderately broad brown outer border: expanse of wings 8½ lines.

Allied to *S. sinica*, but smaller, rather differently marked, and with the primaries and thorax above vermillion instead of pinky-yellowish.

Section MILTOCHRISTA, *Hübner*.

139. Miltochrista miniata = Geometra miniata Forster, Nov. Sp. Ins. Cent. 1, p. 75. *Hab.*—Europe.

DIANASA, *Walker*. (Pl. VIII. fig. 9.)

140. Dianasa suffusa, Wlk. Lep. Het. 2, p. 488. *Hab.* —Moreton Bay, Australia.

Var. obscura.

Primaries like the male of *D. suffusa* as figured by Felder (Reise der Nov. Lep. 4, pl. cxxxix. fig. 55), but the secondaries with the apical half smoky-brown.

We have two examples of this interesting variety.

PTYCHOGLENE, *Felder*.

141. Ptychoglene erythrophora, Felder, Reise der Nov. Lep. iv. pl. cvi. fig. 26. *Hab.*—Mexico.

142. Ptychoglene æqualis = Lithosia æqualis, Wlk. Lep. Het. 2, p. 511. *Hab.*—Guatemala.

Differs from the preceding species in its rather smaller size and the narrower black border of the primaries.

143. Ptychoglene sanguineola = Lithosia sanguineola, Boisduval, Lep. Guat. p. 95 (1870). *Hab.*— Mexico.

In this species the border of all the wings is narrow, and the coloration, especially of the secondaries, much paler: surely *Anatolmis Grotei* is congeneric with the above.

DYPHLEBIA, *Felder*.

144. Dyphlebia bicolora = Lithosia bicolora, Boisduval, Voy. de l'Astrolabe 1, Lep. p. 211, pl. iii. fig. 9. *Hab.*—Tasmania, Sydney, Australia.

Digitized by Google

145. Dyphlebia liboria = Phalæna liboria, Cramer, Pap. Exot. iv. pl. cccxlv. fig. D. *Hab.*—Ceram.

146. Dyphlebia elegans, n. sp. *Hab.*—Abyssinia.

Primaries with the basi-costal half ochreous, and the interno-external half blackish-brown, the oblique division between the two areas being jagged; secondaries with the costa and basal half ochreous, the external area broadly black-brown, with its inner edge dentated; body ochreous, dusky at base of abdomen; pectus, upper surface of legs and under surface of femora black: expanse of wings 1 inch.

D. Trimenii of Felder is intermediate between this species and the following.

147. Dyphlebia tricolora, n. sp. *Hab.*—Aru Islands.

Primaries reddish-orange, with a narrow black border from the base of the costa to near the base of the inner margin; secondaries golden- or cadmium-yellow, with a broad black outer border which narrows abruptly from the first median branch to the anal angle; body dark brown, with the collar and tegulæ reddish-orange; primaries below yellow with a broad external brown border, occupying more than a third of the wing, the wings otherwise as above; body below dark brown with the centre of the venter reddish-orange: expanse of wings 1 inch 4 lines.

The under surface of this species is not at all unlike the Caffrarian *D. Trimenii*.

Lycomorpha, *Harris*.

148. Lycomorpha pholus = Sphinx pholus, Drury, Ill. Exot. Ent. ii. pl. xxviii. fig. 3. *Hab.*—Nova Scotia, United States.

149. Lycomorpha centralis, Wlk. Lep. Het. 2, p. 288. *Hab.*—?

Nearly allied to the preceding species, and apparently intermediate between it and the *Pyromorpha dimidiata* of Herrich-Schäffer (to which *Malthaca perlucida*, Clemens, has been referred). Not having seen examples of the latter I am unable to say whether any structural differences exist, but I see that Mr. Stretch has regarded *Pyromorpha* as distinct.

Digitized by Google

Mr. Stretch has indicated two other species which he calls *L. Miniati* and *L. Palmerii*.

LACTURA, *Walker*.

150. Lactura dives, Wlk. Lep. Het. 2, p. 485. *Hab.*—Australia.

CALLATOLMIS, nov. gen.

Allied to *Atolmis*, but the first subcostal branch of secondaries forked, and the first median branch absent; body more robust, the antennæ strongly pectinated. Type, *C. coleoptrata*.

151. Callatolmis coleoptrata = Lycomorpha coleoptrata, Wlk. Lep. Het. 2, p. 288. *Hab.*—Tapajos.

Atychia? diabolus of Felder seems to me to be referable to the same genus.

ATOLMIS, *Hübner*.

152. Atolmis rubricollis = Noctua rubricollis, Linn. Syst. Nat. 1, 2, p. 840. *Hab.*—Europe.

We do not possess *A. atratula, nictitans*, and *flavicapilla*, so that I am unable to say whether or not they are congeneric.

EPATOLMIS, nov. gen.

Form of *Clelea;* head and thorax very hairy; primaries trigonate; second and third median branches emitted near together at the end of the cell; first median from just beyond the middle of the nervure; secondaries trigonate; subcostal emitting two branches from the end of the cell; upper discocellular strongly angulated, three times the length of the lower (which is transverse); one radial; second and third median branches emitted together from the end of the cell. Type, *E. japonica*.

153. Epatolmis japonica = Atolmis japonica, Wlk. Lep. Het. Suppl. 1, p. 223. *Hab.*—Japan.

ARDONEA, *Walker*.

154. Ardonea morio, Wlk. Lep. Het. 2, p. 482.
Doracis coracina, Boisduval, Lep. Guat. p. 96 (1870). *Hab.*—Venezuela and Mexico.

This is a common species which, as Boisduval remarks,

Digitized by Google

"seems to connect itself with *Ctenucha*." It is, however, without doubt a *Lithosiid*.

CORACIA, *Hübner*.

155. Coracia ciliaris = Eyprepia ciliaris, Ochsenheimer, Schmett, iii. p. 350. ♂, ♀. *Hab.*—Alps.

COSSA, *Walker*.

156. Cossa basigera, Wlk. Lep. Het. Suppl. 1, p. 233. ♂. *Hab.*—South India.

157. Cossa inducta = Lithosia inducta, Wlk. Lep. Het. Suppl. 1, p. 232. ♀. *Hab.*—South India.

Probably this is the female of the preceding species.

158. Cossa replana = Phalæna replana, Lewin, Prodr. Ent. xvi. pl. xv. ♂, ♀. *Hab.*—Sydney, Moreton Bay, Australia.

The sexes of this species are quite unlike in pattern.

159. Cossa vagivitta = Lithosia vagivitta, Wlk. Lep. Het. Suppl. 5, p. 1884. *Hab.*—Mysol.

LITHOSIA, *Fabricius*.

160. Lithosia bicosta, Wlk. Lep. Het. 2, p. 506. *Hab.*—Sydney.

161. Lithosia fraterna, n. sp. *Hab.*—Tasmania.

Nearly allied to the preceding species. Primaries dark sericeous greyish-brown, with a slender deep orange costal border and a silvery-white subcostal stripe; secondaries bright stramineous; head and tegulæ reddish-orange; thorax dark greyish-brown; abdomen paler brown; primaries below paler than above and becoming whitish towards outer margin; body brown; palpi and proboscis orange, legs blackish; anterior coxæ whitish: expanse of wings 1 inch 3 lines.

162. Lithosia nana, Wlk. Lep. Het. 2, p. 507. *Hab.*—Sydney, Moreton Bay.

163. Lithosia antica, Wlk. Lep. Het. 2, p. 505. *Hab.*—Ceylon.

Digitized by Google

164. Lithosia Sarawaca, n. sp.
Lithosia antica, Wlk. in Journ. Linn. Soc. vi. p. 103. *Hab.*—Sarawak.

Readily distinguished from *L. antica* by its whitish secondaries, the apex and fringe ochreous; abdomen dusky.

We have three examples of this species, so that I have no doubt respecting the constancy of the above-mentioned differences. *L. natara* is nearly allied, but differs in its smaller size and shorter fringes.

165. Lithosia vicaria, Wlk. Lep. Het. 2, p. 505. *Hab.*—Congo.

166. Lithosia lurideola, Treitschke, Suppl. Ochs. Schmett, x. 1, p. 162. *Hab.*—Europe.

167. Lithosia plumbeola, Herr.-Sch. Eur. Schm. ii. p. 158. *Hab.*—Europe.

168. Lithosia complana, Linn. Syst. Nat. 1, 2, p. 840. *Hab.*—Europe.

169. Lithosia depressa, Esper, Eur. Schm. iv. pl. xciii. fig. 3. *Hab.*—Europe.

170. Lithosia griseola, Hübner, Bomb. p. 126, pl. xxiii. fig. 97. *Hab.*—Europe.

171. Lithosia serva, Wlk. Lep. Het. 2, p. 506. *Hab.*—Nepal.

172. Lithosia arideola, Hering, Ent. Zeit. Stett. vii. p. 233. *Hab.*—Europe.

173. Lithosia fumeola, Wlk. Lep. Het. 2, p. 508. *Hab.*—Cape, Knysna.

There are two Japanese species allied to this.

174. Lithosia unita, Denis and Schiff. Wien. Verz. p. 68. *Hab.*—Europe.

We do not possess *L. morosina* or *cinereola*.

175. Lithosia luteola, Denis and Schiff. Wien. Verz. p. 68. *Hab.*—Europe.

Digitized by Google

176. Lithosia gilveola, Ochsenheimer, Schm. Eur. iii. p. 137. *Hab.*—Europe.
L. vitellina appears to be allied to this species.

177. Lithosia aureola, Ochsenheimer, Schm. Eur. iii. p. 140. *Hab.*—Europe.

178. Lithosia nitens, Wlk. Lep. Het. Suppl. 1, p. 231.
Lithosia remota, Wlk. Char. Het. Lep. p. 9, n. 12 (1869). *Hab.*—Moreton Bay.
Allied to the preceding species.

179. Lithosia brevipennis, Wlk. Lep. Het. 2, p. 509. *Hab.*—Ceylon.
L. intacta of Walker is probably identical with *L. præcipua.*

180. Lithosia intermixta, Wlk. Lep. Het. Suppl. 1, p. 229. *Hab.*—South India.

181. Lithosia apicalis, Wlk. Journ. Linn. Soc. vi. p. 104. *Hab.*—Sarawak.

182. Lithosia decreta, n. sp. *Hab.*—Sarawak.
Primaries and thorax ochreous; secondaries creamy whitish; abdomen sordid whitish, the sides and posterior segments tinted with ochreous: under surface ochraceous, primaries paler than above, secondaries with the costa ochreous: expanse of wings 9 lines.
Possibly a very small example of *L. simplex*, a species unknown to me excepting from Walker's description; but I suspect it to be distinct, as the primaries of *L. simplex* appear to be pale luteous, whereas those of *L. decreta* are bright ochreous.

183. Lithosia bipunctigera, Wallengren, Wien. Ent. Monatschr. iv. p. 45 (1860).
Setina quadrinotata, Wlk. Lep. Het. Suppl. 1, p. 237. *Hab.*—Natal.
I do not see the slightest reason for separating this from its near allies to form a genus, therefore I cannot adopt Wallengren's name *Lexis*; *L. bipunctigera* is nearly allied to *L. luteola* and many other species.

Digitized by Google

184. Lithosia innotata, Wlk. Ms.? *Hab.*—N. India, Nepal.

Wings above straw-coloured, the primaries slightly darker than the secondaries; body ochraceous, the base of the abdomen pale: wings below as above, excepting that the primaries are washed with greyish from the centre of the cell to the middle of the discal area: pectus whitish, legs whitish broadly banded with black, venter ochreous: expanse of wings 1 inch 6 lines.

I have not succeeded in finding a published description of *L. innotata*. It is a slender-bodied species, and might, perhaps, have been mistaken by Walker for an aberrant Pyrale.

185. Lithosia helveola, Hübner, Bomb. 125, pl. xxiii. fig. 95. *Hab.*—Europe.

We have a nearly-allied species from Japan.

186. Lithosia pristina, Wlk. Lep. Het. Suppl. 5, p. 1885. *Hab.*—Moreton Bay.

187. Lithosia albidula, Wlk. Lep. Het. Suppl. 1, p. 231. *Hab.*—Sierra Leone and Lake Nyassa.

188. Lithosia cephalica, Grote, Trans. Am. Ent. Soc. iii. p. 176 (1870); Stretch Zyg. and Bomb. pl. vii. fig. 14 (1873). *Hab.*—Texas.

189. Lithosia pygmæa, Wlk. Lep. Het. 2, p. 507.
Lithosia scutellata, Wallengren, Wien. Ent. Monatschr. iv. p. 45 (1860). *Hab.*—South Africa.

I am satisfied that if *L. cephalica* had been generically distinct from Lithosia, our American friends would have found it out; and, since Wallengren's *L. scutellata* is nearly allied to *L. cephalica*, I cannot accept his genus *Sozuza*.

190. Lithosia caniola, Hübner, Bomb. 126, pl. lxxxi. fig. 220. *Hab.*—Europe.

191. Lithosia impervia, Wlk. Lep. Het. Suppl. 1, p. 230. *Hab.*—Ceram.

192. Lithosia conformis, Wlk. Lep. Het. 2, p. 509. *Hab.*—North India.

Digitized by Google

193. Lithosia varana, Moore, Proc. Zool. Soc. 1865, p. 797. *Hab.*—Darjeeling.

194. Lithosia insolita, Wlk. Lep. Het. 2, p. 497. *Hab.*—Shanghai.

195. Lithosia præcipua, Wlk. Lep. Het. Suppl. 1, p. 229. *Hab.*—North China, Sarawak.

196. Lithosia kingdoni, n. sp. *Hab.*—Madagascar.

Primaries creamy white; a black spot near the base, a second close to the end of the cell, and an elbowed series of seven across the disc; secondaries soft stramineous; head and thorax creamy white, spotted with black; abdomen stramineous; wings below stramineous, unspotted; body below subochraceous, anterior coxæ spotted with black; legs whitish, anterior femora blackish above, anterior tibiæ blackish below; tarsal claws black; venter with a lateral series of black spots, anal segment ochreous: expanse of wings 2 inches.

I have named this species after Mr. Kingdon (Missionary), through whose efforts the Museum has obtained several interesting Mascarene novelties.

197. Lithosia? puncticollis, n. sp. *Hab.*—Sarawak.

Primaries above pale buff; an indistinct dusky dot at the end of the cell, and two almost confluent trigonate blackish spots below it; secondaries becoming gradually white towards abdominal margin; head and thorax pale buff, a black spot on the crest, two on the collar, and one on each tegula; thorax apparently with a central black spot (our example is a little rubbed); abdomen ochraceous, clothed with long hairs; wings below paler than above, the primaries with the external third slightly dusky; body ochraceous, legs pale buff: expanse of wings 1 inch 7 lines.

This species might perhaps be separated from *Lithosia;* the *form* of the wings agrees better with *Œonistis;* but as I do not yet know one or two of Walker's genera of Bornean *Lithosiids*, I prefer to leave this species provisionally in *Lithosia.*

198. Lithosia vetusta, Wlk. Lep. Het. 2, p. 506.
Lithosia muricolor? Wlk. Journ. Linn. Soc. vi. p. 105. *Hab.*—Shanghai; Sarawak.

The Bornean example is slightly darker than our

Digitized by Google

Chinese specimens which appear to be faded. The species ought, perhaps, to be placed next to *L. griseola*, which it nearly resembles.

199. Lithosia aspersa, Wlk. Journ. Linn. Soc. vi. p. 104. *Hab.*—Sarawak.

200. ♀ Lithosia rotundipennis, Wlk. Journ. Linn. Soc. vi. p. 104.
♂ *Lithosia nodicornis*, Wlk. l. c.
Lithosia chilomorpha, Snellen, Tijd. voor Ent. 1877, pl. v. fig. 1. *Hab.*—Sarawak.
This, the preceding and the succeeding species, differ somewhat from the other species of this genus in the form of the primaries, but *L. reticulata* and *L. angulifera* seem to form a transition between them and *L. muscerda*.

201. Lithosia sambara, Moore, Cat. Lep. E. I. C. ii. p. 304. *Hab.*—Java.

202. Lithosia reticulata, Moore, Proc. Zool. Soc. 1865, p. 798. *Hab.*—Darjeeling.

203. Lithosia muscerda, Hübner, Bomb. 127, pl. xxiv. fig. 103. *Hab.*—Europe.

204. Lithosia prabana, Moore, Cat. Lep. E. I. C. ii. p. 304. *Hab.*—Java.
I believe Walker's *L. nigricans* from Borneo to be this species, but his description is too bad for positive identification.

205. Lithosia natara, Moore, Cat. Lep. E. I. C. ii. p. 304. *Hab.*—Java.
This and the preceding species would perhaps be better placed near *L. antica*.
Lithosia colon of Moeschler appears to resemble *L. bipuncta* of Rambur.

Corcura, *Walker*.

206. Corcura torta, Wlk. Journ. Linn. Soc. vi. p. 111. *Hab.*—Sarawak.
Diastrophia dasypyga of Felder appears to be an allied species.

Digitized by Google

207. Corcura discalis = Lithosia discalis, Wlk. Journ. Linn. Soc. vi. p. 108. *Hab.*—Sarawak.

If I have rightly identified this species there can be no question about its being a *Corcura*.

TEULISNA, *Walker*.

208. Teulisna chiloides, Wlk. Journ. Linn. Soc. vi. p. 109. *Hab.*—Sarawak.

209. Teulisna tortricoides = Lithosia tortricoides, Wlk. Journ. Linn. Soc. vi. p. 107. *Hab.*—Java.

210. Teulisna biplagella, n. sp. *Hab.*—Sarawak.
"*Œcophora biplagella*," Walker, Ms.

Nearly allied to the preceding species; primaries above stramineous with an oblong brown spot on the centre of the costal border; costa narrowly blackish at apex; secondaries whitish stramineous; body whitish, tinted with stramineous; under surface without black markings: expanse of wings 1 inch.

211. Teulisna signata = Lithosia signata, Wlk. Lep. Het. 2, p. 495. *Hab.*—Shanghai.

212. Teulisna oblonga, n. sp.
Lithosia tetragona, Wlk. Journ. Linn. Soc. vi. p. 103. *Hab.*—Sarawak.

Whiter than *T. tetragona*, with the quadrangular black patch on primaries of only two-thirds the length; the secondaries almost pure white.

213. Teulisna tetragona = Lithosia tetragona, Wlk. Lep. Het. 2, p. 510. *Hab.*—Silhet.

214. Teulisna plagiata, Wlk. Journ. Linn. Soc. vi. p. 109. *Hab.*—Sarawak.

215. Teulisna Bertha, n. sp. *Hab.*—Java (*Horsfield*).

Primaries pale greyish-brown, slightly darker at outer margin; basal half of costa and fringe whitish; a large subquadrate black-brown spot with a whitish border across the middle of the wing, touching the inner margin but not reaching the costa, followed by an indistinct irregular

Digitized by Google

pale-brown fascia; secondaries grey, basal area and fringe whitish; head and tegulæ white, thorax dark brown, abdomen grey; wings below darker than above, but the blackish spot of primaries only indistinctly visible through the wings; body below ochraceous: expanse of wings 11 lines.

Chiefly differs from *T. plagiata* in the darker primaries, without the irregular almost interrupted black discal band, and in the paler secondaries.

ŒONISTIS, *Hübner*. (Pl. VIII. fig. 3.)

216. Œonistis quadra = Noctua quadra, Linn. Syst. Nat. i. 2, p. 840. *Hab.*—Europe.

217. Œonistis basinota = Lithosia basinota, Moore, Proc. Zool. Soc. 1865, p. 798. *Hab.*—Darjeeling.

CHRYSÆGLIA, nov. gen.

Differs from *Lithosia* in the neuration of the secondaries; the subcostal branches emitted together from the upper extremity of the cell and the second and third median branches from the lower extremity of the cell (in neither case from a footstalk). From *Crambomorpha* it differs in having three instead of four median branches and the subcostals not emitted from a footstalk. Type, *C. magnifica*.

218. Chrysæglia magnifica = Lithosia magnifica, Wlk. Journ. Linn. Soc. vi. p. 103. *Hab.*—Sarawak.

CRAMBOMORPHA, *Felder*. (Pl. VIII. fig. 16.)

219. Crambomorpha entella, Cramer, Pap. Exot. iii. pl. ccviii. fig. D. *Hab.*—India, Sarawak.

220. Crambomorpha delia, Fabricius, Ent. Syst. iii. 2, p. 25. *Hab.*—Aneiteum, New Hebrides.

This appears to me to be distinct from *C. entella*, the hatchet-shaped band being of only half the width and the oval apical spot shorter and broader.

221. Crambomorpha beema = Lithosia beema, Moore, Proc. Zool. Soc. 1865, p. 798. *Hab.*—Darjeeling.

Digitized by Google

222. Crambomorpha splendens, n. sp. *Hab.*—Bombay (*Dr. Leith*).

Wings smoky-brown; primaries bronzy, the veins broadly bordered with metallic dark green, especially towards the base; a bright longitudinal basal golden-yellow streak on the interno-median area; base of inner margin irrorated with golden; body darker brown, more or less shot with dark metallic green excepting at the base of the abdomen; collar golden-yellow; wings below smoky-brown, the primaries with a yellowish basal interno-median dash; palpi, pectus and basal two-thirds of femora golden-yellow, remainder of legs blackish, with dark greenish reflections; venter yellow in the centre, blackish at the sides: expanse of wings 1 inch 8 lines.

C. umbrifera of Felder is one of the links between this species and the following.

223. Crambomorpha remelana = Lithosia remelana, Moore, Proc. Zool. Soc. 1865, p. 798. *Hab.*—Darjeeling.

224. Crambomorpha argentea, Felder, Reise der Nov. Lep. 4, pl. cvi. fig. 10. *Hab.*—Espiritu Sancto.

225. Crambomorpha monoleuca = Halesidota monoleuca, Walker, Lep. Het. Suppl. 5, p. 1911. *Hab.*—Bogota.

Nearly allied to the preceding species.

226. Crambomorpha argentifera = Halesidota argentifera, Wlk. Lep. Het. Suppl. 5, p. 1911. *Hab.*—Venezuela.

Larger than the preceding, and without the yellowish costal margin to the primaries.

CHRYSORABDIA, nov. gen.

Subcostals of secondaries emitted from a short footstalk; discocellulars obliquely standing inwards with a slight curve; median vein three-branched, the second and third branches emitted from the end of the cell without a footstalk. Type, *C. viridata.*

227. Chrysorabdia viridata = Lithosia viridata, Wlk. Lep. Het. Suppl. 1, p. 225. *Hab.*—Darjeeling.

Digitized by Google

228. Chrysorabdia strigata = Lithosia strigata, Moeschler, Stett. Ent. Zeit. 1872, p. 353. *Hab.*—Sikkim. ? = ♀ of 227.

AREVA, *Walker*. (Pl. VIII. fig. 10.)

229. Areva laticilia, Wlk. Lep. Het. 2, p. 526. *Hab.*—Venezuela.

CALAMIDIA, nov. gen. (Pl. VIII. fig. 4.)

Approaching *Chrysæglia* in structure, but the primaries in shape more resembling *Areva*, the second and third subcostal branches united by a cross vein, so as to make a postdiscoidal cellule, the fork of the third branch shorter, the upper radial springing from the postdiscoidal cell, the lower radial from the upper extremity of the cell (instead of at the lower extremity close to the second and third median branches, as in *Chrysæglia*). Type, *C. hirta*.

230. Calamidia hirta = Lithosia hirta, Wlk. Lep. Het. 2, p. 510. *Hab.*—Sydney.

LYSCEIA, *Walker*.

231. Lysceia bigutta, Wlk. Lep. Het. 2, p. 541. *Hab.*—South Africa.

EUSTIXIA, *Hübner*.

232. Eustixia subfervens = Mieza subfervens, Wlk. Lep. Het. 2, p. 528. *Hab.*—United States.

233. Eustixia igninix = Mieza igninix, Wlk. Lep. Het. 2, p. 527. *Hab.*—United States, E. Florida.

CYPTASIA, *Walker*.

Closely allied to the preceding genus.

234. Cyptasia egregiella, Wlk. Lep. Het. Suppl. 5, p. 1837. *Hab.*—Swan River and Moreton Bay.

Mieza? erythrocera is apparently a second species of this genus.

THEMISCYRA, *Walker*.

235. Themiscyra lætifera, Wlk. Lep. Het. Suppl. 1, p. 258. *Hab.*—Moreton Bay.

Digitized by Google

236. Themiscyra mactata = Mieza mactata, Felder, Reise der Nov. Lep. 5, pl. cxxxix. fig. 44.
Themiscyra varicosa, Butler, Ann. & Mag. Nat. Hist. s. 4, vol. xviii. p. 126. *Hab.*—Cape York.

Mieza? phœnodes appears to belong also to this genus.

TIGRIOIDES, n. gen. (Pl. VIII. fig. 18.)

Readily distinguished from *Lithosia* by the very short discoidal cell of secondaries, the subcostal branches, and the second and third median branches emitted from extremely long footstalks. Type, *T. alterna.*

237. Tigrioides alterna = Setina alterna, Wlk. Lep. Het. 2, p. 520. *Hab.*—New Holland, Sydney, Moreton Bay, Hunter River.

238. Tigrioides transversa = Lithosia transversa, Wlk. Lep. Het. Suppl. 1, p. 229. *Hab.*—Australia.
Nearly allied to *T. alterna.*

STENOPLASTIS, *Felder.*

239. Stenoplastis venata, n. sp. *Hab.*—Espiritu Sancto.
Primaries smoky-brown, with whitish veins, the discocellulars broadly whitish; three transverse denticulated black-brown lines, the first crossing the cell, the others beyond it, the outermost bordered externally by a series of hastate whitish spots; secondaries grey, becoming brownish at apex; a blackish marginal line, fringe grey; head and thorax smoky-brown, with a blackish longitudinal line; abdomen grey; primaries below greyish-brown, costal margin whitish, fringe brown; secondaries grey, fringe brown; body below greyish-brown; palpi and legs underneath whitish: expanse of wings 1 in. 2—6 lin.

Most nearly allied to an undescribed species in Dr. Moeschler's Collection from Surinam, and which he intends to call *S. furcata;* it is, however, abundantly distinct.

The genera *Brachyglene* and *Ischnocampa* should, I think, be placed here.

CLINA, *Walker.*

240. Clina lapidaria, Wlk. Lep. Het. Suppl. 1, p. 257. *Hab.*—South India.

Digitized by Google

241. Clina acclinatella = Lithosia ? acclinatella, Wlk. Lep. Het. Suppl. 1, p. 232. *Hab.*—South Africa.

Eucreagra seems to be an allied genus.

SPIRIS, *Hübner*.

242. Spiris funerea, Eversmann, Bull. Mosc. 1847, iii. p. 77, pl. 5, 5. *Hab.*—Amur Land.

243. Spiris striata, Linnæus, Syst. Nat. x. p. 205. *Hab.* —Europe.

Var. *pallida*. Veins of primaries obsolete; secondaries pale, not dusky at base, with slender discocellular litura and narrow marginal blackish border. *Hab.*—♂, ♀ Europe.

244. Spiris cribrum, Linn. Syst. Nat. ii. p. 831. *Hab.*— Europe.

245. Spiris punctigera, Freyer, Neuere Beitr. p. 140. *Hab.*—Europe.

We have five examples of this form, so if it be a variety of the preceding it must be very common.

246. Spiris candida, Cyrilli, Ent. Neap. 6, p. 5 (1787). *Hab.*—Europe.

SIDYMA, *Walker*.

247. Sidyma albifinis, Wlk. Lep. Het. 7, p. 1686. *Hab.*— Masuri.

This species calls to mind Felder's *Ischnognatha semiopalina*.

DEIOPEIA, *Stephens*.

248. Deiopeia pura, n. sp. *Hab.*—Brazil, Guatemala, and Galapagos Islands.

Under this name I wish to distinguish what may possibly be a pale form of *D. ornatrix*, but which seems to be even commoner than that species; it differs in the clear pinky-whitish primaries and the much less heavily black-bordered secondaries, the discocellulars of the latter wings being at most very slenderly blackened, and the posterior projection of the black border only extending about half

Digitized by Google

as far into the wing; in some examples the border is reduced to two isolated marginal spots.

249. Deiopeia ornatrix = Noctua ornatrix, Linn. Syst. Nat. ii. p. 829. *Hab.*—Bolivia, Venezuela, Nevis.

Var. Stretchii.

Utetheisa — ?, Stretch, Zyg. and Bomb. pl. ii. fig. 17. *Hab.*—Honduras.

Var. hybrida.

Primaries of *D. bella*, but the yellow belts indistinct, secondaries of typical *D. ornatrix*, but with the ground colour red as in *D. bella*, and with a white-edged interrupted black belt across the discoidal cell. *Hab.*—United States.

250. Deiopeia bella = Tinea bella, Linn. Syst. Nat. 1, 2, p. 884. *Hab.*—United States, E. Florida.

Var. intermedia.

Primaries with the yellow belts very pale, so that the white borders of the black spots show faintly; secondaries exactly like *D. speciosa*. *Hab.*—United States.

Mr. Stretch says (Zyg. & Bomb. p. 58), "I have yet to see anything which is intermediate in color between *U. bella* and *speciosa*."

251. Deiopeia speciosa, Wlk. Lep. Het. 2, p. 568. *Hab.*—Jamaica, Haiti.

252. Deiopeia pulchella = Tinea pulchella, Linn. Syst. Nat. 1, 2, p. 884. *Hab.*—Germany, Spain, Cape, Natal, Ashanti, Turkey, N. India, Nepal, S. India, Ceylon, Australia, Port Essington, Moreton Bay.

Var. lotrix, Cramer, Pap. Exot. ii. p. 20, pl. cix. fig. E.

Hab.—Ceylon, Philippines, Keelong Islands, New Guinea, Sydney, Moreton Bay.

Var. candida.

Hab.—Congo, Interior of South Africa, Natal, Cape.

Primaries with the scarlet spots so pale as to be scarcely visible, but the black spots large and well defined.

253. Deiopeia thyter, n. sp. *Hab.*—Turkey, Punjab.

General pattern of *D. pulchella*, but the black spots of

Digitized by Google

primaries reduced to points, many of them being absent, and the scarlet spots of interno-median and external areas united into bands; marginal black border of secondaries narrower, the terminal quadrate projection very small; head and thorax streaked with yellow, but without black spots.

I believe Mr. Moore has this species also from Cashmere. It seems to come near to *D. lepida* of Rambur, from Madagascar.

254. Deiopeia venusta = Utetheisa venusta, Hübner, Sml. Exot. Schm. Zutr. figs. 521, 522. *Hab.*—Mauritius and Madagascar.

We have an insect (perhaps a variety of this species) in which the white patch of primaries is much smaller and tinted with pink, and the border of secondaries is much more regular. Unfortunately this specimen is without a locality, so that I cannot venture to decide whether or not it is a distinct species.

Moore's *D. semara* comes near to *D. venusta*, but has a yellow streak through the primaries.

Lithosia Laymerisa of Grandidier appears from the description to be a *Deiopeia*, but *D. occultans* of Vollenhoven seems to differ from that genus in the form of the secondaries, and would, perhaps, be best placed with *D. picta* in a distinct genus.

SOMMERIA, *Hübner*.

255. Sommeria culta, Hübner, Sml. Exot. Schm. Zutr. figs. 433, 434.
Spilosoma? marmorata, Wlk. Lep. Het. Suppl. 1, p. 293. *Hab.*—South Africa, Cape.
Homæognatha aganais of Felder may be congeneric.

256. Sommeria? privata = Anthora privata, Wlk. Lep. Het. Suppl. 2, p. 334. *Hab.*—Natal.
Bithra spilosomoides probably belongs to this genus.

DIGAMA, *Moore*.

257. Digama nebulosa, Wlk. Lep. Het. Suppl. 1, p. 238. *Hab.*—India.

258. Digama fasciata, n. sp. *Hab.*—Ceylon.
Primaries dust-grey; two dots at the base, three costal

Digitized by Google

spots (that nearest the base lunate), two dots in the cell, a sigmoidal litura closing the cell, a dot beyond it, an elongate spot or dash and two dots in a longitudinal line on the interno-median interspace, and two dots on the internal interspace, black; a large spot on the inner margin near the base, and an irregular discal interrupted band (the nervures across which are blackish), dark brown; secondaries bright stramineous becoming whitish on the costa; thorax dust-grey, spotted with black, abdomen ochreous with a dorsal row of black dots; primaries below brown, dusky in the cell, the latter with a central black dot and a terminal black streak; secondaries creamy yellow with a faint pink shot; a black spot on upper discocellular; body below creamy-whitish, the legs spotted with black; venter subochreous, with a lateral series of black dots: expanse of wings 1 inch 4 lin.

259. Digama marchalii = Callimorpha? marchalii, Guérin, Voy. Deless. Hist. Nat. p. 91, pl. xxvi. fig. 2. *Hab.*—India.

260. Digama insulana, Felder, Verh. Zool.-Bot. Ges. 1868, p. 285.
Digama hearseyana ♂, Moore, Cat. Lep. E. I. C. 2, pl. vii*a*. fig. 3. *Hab.*—♂, ♀ Ceylon.

The Indian males taken by General Hearsey agree in all points of coloration with the female as figured by Moore; whereas the Ceylonese species agrees with the male, as represented on pl. vii*a*. in having the primaries pale dove-brown, slightly deeper towards outer margin, and without dark blackish spots or a trace of the whitish lines which occur on *D. hearseyana*.

261. Digama hearseyana, Moore, Cat. Lep. E. I. C. 2, p. 298, ♀, pl. vii*a*. fig. 3*a*. *Hab.*—Punjab, North India, South India, Ceylon.

262. Digama marmorea, n. sp. *Hab.*—North Australia.

Primaries sepia-brown, crossed obliquely by a broad, irregular greyish-white band, spotted here and there with brown, its inferior extremity continued inwards as a broad basi-internal border, and marked with two black spots, a black oblique line bounding the inner edge of the band on the costal area, a second, less oblique, crossing it upon the same area and limited by the subcostal vein, four black

Digitized by Google

dots forming a quadrangle in the centre of the band; two black dots (still upon the band) placed obliquely immediately beyond the cell; three irregular C-shaped whitish markings in a line across the disc, the uppermost near to apex, the lowermost, confused, placed near external angle; a dusky regular submarginal line, beyond which is an abbreviated white marginal line; fringe white, spotted with brown; secondaries ochreous, with a large apical brown patch; thorax greyish, spotted with black, tegulæ dark brown; abdomen ochreous, with dorsal and lateral series of black dots; wings below much paler than above, primaries pale silky brown, with a broad abbreviated costal streak crossed near the end by a large black spot and terminating in a dark-brown spot; a black dot in the cell, and another beyond it; secondaries with the apex pale silky brown; a triangular black spot on the upper discocellular, and a larger spot on the costa near apex; body below white, legs banded with brown, venter with a well-defined lateral series of black spots: expanse of wings 1 inch 1 line.

MOSODA, *Walker*.

263. Mosoda anartoides, Wlk. Lep. Het. Suppl. 5, p. 1900. *Hab.*—Australia.

HALONE, *Walker*.

264. Halone sobria, Wlk. Lep. Het. 2, p. 540. *Hab.*—Natal.

Nearly allied to the preceding genus.

CLISOBARA, *Walker*.

265. Clisobara catocalina, Wlk. Lep. Het. Suppl. 1, p. 269. *Hab.*—Moreton Bay, Australia.

Nearly allied to the genus *Halone*.

ARGINA, *Hübner* (Group Xanthestes, *Rambur*).
(Pl. VIII. fig. 5.)

266. Argina leonina = Deiopeia leonina, Wlk. Lep. Het. Suppl. 1, p. 262. *Hab.*—Sierra Leone.

267. Argina dulcis = Deiopeia dulcis, Wlk. Lep. Het. 2, p. 569.

Phalæna cribraria var. Cramer, Pap. Exot. iii. pl. 288, D. *Hab.*—Canara, South India.

Digitized by Google

268. Argina pardalina? = Deiopeia pardalina, Wlk. Lep. Het. Suppl. 1, p. 263. *Hab.*—Moulmein.

269. Argina guttata = Xanthestes guttata, Rambur, Faune de l'Andalousie ii. p. 229.
Phalæna cribraria, ♂, Cramer (nec Clerck), Pap. Exot. iii. pl. ccviii. fig. C. *Hab.*—Rodriguez, Mauritius, Ceylon, India, Nepal.

This and the four following are probably all varieties of one common and widely-distributed species.

270. Argina notata, n. sp. *Hab.*—North India.

Differs from its near allies in the larger rounded spots of primaries, which are not surrounded by white or grey irides.

271. Argina cribraria, Clerck, Icones, pl. liv. fig. 4. *Hab.*—Punjab, North India, Penang, Hong-Kong.

272. Argina astrea = Phalæna astrea, Drury, Ill. 2, pl. vi. fig. 3.
Phalæna cribraria, ♀, Cramer, Pap. Exot. iii. pl. ccviii. fig. G. *Hab.*—Ceylon, North India, Rodriguez.

273. Argina pylotis = Phalæna pylotis, Fabricius, Ent. Syst. iii. 1, p. 479. *Hab.* — North India, Ceylon.

Extremely close to the preceding form.

274. Argina ocellina = Deiopeia ocellina, Wlk. Lep. Het. 2, p. 571. *Hab.*—Lizard Island, East Africa, Zoolu, Natal, Madagascar.

Deiopeia lepida of Walker is a *Zerenopsis*.

275. Argina cingulifera = Deiopeia cingulifera, Wlk. Lep. Het. 2, p. 569. *Hab.*—Congo.

Chiefly differs from the preceding species in having the black spots encircled with white.

276. Argina albocincta = Xanthestes albocincta, Rambur, Faune de l'Andalousie ii. p. 229 (Note). *Hab.*—Natal.

Differs from the preceding species in its slightly greater

Digitized by Google

size, the larger spots of primaries, the wider and continuous submarginal band of secondaries, and the presence of two additional black spots on either side of the discoidal cell in these wings. This is without doubt the *D. pylotis* of Boisduval, but not of Fabricius.

(Group ARGINA, *Hübner.*)

277. Argina argus = Euprepia? argus, Kollar, Kaschmir von Von Hügel, p. 467, pl. xxi. fig. 3. *Hab.*—Simla, North India, Nepal, Calcutta, South India, Ceylon.

278. Argina syringa = Phalæna syringa, Cramer, Pap. Exot. 1, pl. v. C. D. *Hab.*—North India, Ceylon, Australia.

TATARGINA, nov. gen. (Pl. VIII. fig. 17.)

Allied to *Argina*, but the primaries narrower, the secondaries more acuminate at apex, the discocellulars of the latter wings more angulated, and the palpi shorter.

Type, *T. picta.*

279. Tatargyna picta = Deiopeia picta, Wlk. Lep. Het. Suppl. 1, p. 263. *Hab.*—Moulmein.

280. Tatargyna formosa, n. sp.

Deiopeia picta, var. B. Wlk. Lep. Het. Suppl. 1, p. 264. *Hab.*—South China.

The white-bordered grey bands of primaries are not only broader than in *T. picta*, but more oblique and less angular; the secondaries, instead of having a few small scattered brown-bordered grey costal spots, have four more or less interrupted brown costal bands, a spot at the inferior extremity of the cell, a second on the middle of the first median branch, and an irregular interrupted litura across the interno-median interspace.

CASTABALA, *Walker.*

281. Castabala roseata, Wlk. Lep. Het. Suppl. 1, p. 271. *Hab.*—India.

Digitized by Google

BŒNASA, *Walker.*

282. Bœnasa nigrorosea, Wlk. Lep. Het. Suppl. 1, p. 266. *Hab.*—Haiti.

This pretty little species nearly resembles our European *Callimorpha jacobææ* in coloration, but the secondaries are much smaller in comparison, and the entire insect is little larger than a single primary of that species.

CALLIMORPHA, *Latreille.*

283. Callimorpha jacobææ = Noctua jacobææ, Linn. Syst. Nat. 1, p. 839. *Hab.*—Europe.

EUBAPHE, *Hübner.*

284. Eubaphe læta = Lithosia læta, Boisduval in Guérin's Règne Anim. Ins. pl. lxxxviii. fig. 6. *Hab.*—?

285. Eubaphe opella ? = Crocota opella, Grote, Proc. Ent. Soc. Phil. vol. i. p. 345, ii. pl. ii. fig. 1 ♀. *Hab.*—United States, Texas (*Belfrage*).

Our specimens differ from Mr. Grote's figure in their smaller size and the wider black-brown marginal band of secondaries. Walker included them with *C. rubicundaria* (excepting the Texan example).

286. Eubaphe brevicornis = Crocota brevicornis, Wlk. Lep. Het. 2, p. 536. *Hab.*—United States.

Walker also placed several examples of this species under his (not Hübner's) *Crocota rubicundaria.*

287. Eubaphe aurantiaca, Hübner, Sml. Exot. Schm. Zutr. figs. 411, 412.

Crocota rubicundaria, Hübner, l. c. figs. 511, 512. *Hab.*—United States.

288. Eubaphe ferruginosa = Crocota ferruginosa, Wlk. Lep. Het. 2, p. 535. *Hab.*—St. Martin's Falls, Hudson's Bay.

Walker placed an example of this species under his *C. rubicundaria.*

EUDULE, *Hübner.*

289. Eudule pulchricolora, Hübner, Sml. Exot. Schm. Zutr. figs. 253, 254. *Hab.*—Pará.

E. variegata of Walker is referable to the genus *Glissa,*

Digitized by Google

and belongs to the *Melameridæ*; *E. bipennis* belongs to the same family, in which it will constitute a new genus allied to *Mennis*.

290. Eudule sanguinea, n. sp. *Hab.*—Probably from Pará.

Wings above bright brick-red, the primaries with costal margin and fringe black, the secondaries with the fringe black; body pale olive-brown, the collar, tegulæ and margins of abdomen red; wings below of a brighter colour, with the outer border (as well as the fringe) and the costal border of primaries brown; body below whity-brown: expanse of wings 11 lines.

Somewhat like the next species, but smaller, considerably darker in colour, and more elegantly formed.

291. Eudule invaria = Ameria invaria, Wlk. Lep. Het. 2, p. 555. *Hab.*—Venezuela.

292. Eudule conformis = Ameria conformis, Wlk. Lep. Het. 2, p. 555. *Hab.*—Mexico.

293. Eudule cupraria = Crocota cupraria, Wlk. Lep. Het. 2, p. 537. *Hab.*—Brazil and Venezuela.

I suspect that the *Lithosia trichoptera* of Perty is this species.

LEPTIDULE, nov. gen. (Pl. VIII. fig. 11.)

Wings delicate, thinly clothed with scales, the costal margin of primaries waved, the outer and inner margins convex; the discoidal cell very long and narrow; first branch of subcostal forked, the lower fork united by a cross-vein to the second branch which emits three nervules from its inferior margin; the first of these nervules answers to the upper radial; discocellulars oblique; the lower radial emitted near the third median branch from the inferior extremity of the cell, the second median near the end of the cell, the first from about the middle of the median nervure; secondaries almost circular; costal vein absent; subcostal three-branched; upper discocellular ⌊-shaped; lower discocellular short and oblique; the radial and the two last branches of the median vein emitted at equal distances: body slender, scarcely exceeding the secondaries, the male with lateral anal tufts; antennæ about half the length of the primaries, palpi small and delicate; legs long and slender, the second pair of tibiæ

Digitized by Google

with short terminal spinules, posterior tibiæ with two pairs of spurs. Type, *L. integra.*

294. Leptidule integra = Ameria integra, Wlk. Lep. Het. Suppl. 5, p. 1893. *Hab.*—Santa Martha.

295. Leptidule sordida, n. sp. *Hab.*—Santa Martha (*Bouchard*).

Sordid ochraceous, secondaries with the outer margin and anal angle smoky-brown, the inner edge being broadly tridentate; body testaceous, the head, collar, tegulæ and anus ochraceous, the tegulæ fringed with smoky-brown; primaries below with the apex greyish; body below ochraceous, the legs blackish above, the tibiæ and tarsal joints below terminally black banded: expanse of wings 9 lines.

SETINA, *Schrank.*

296. Setina flava, Bremer and Grey, Beitr. zur Schm. Nördl. China's, p. 15. *Hab.*—North China.

This is undoubtedly Walker's *S. sinensis*, as suggested by that author.

297. Setina rejecta, Wlk. Lep. Het. 2, p. 521. *Hab.*—?

298. Setina apicalis, Wlk. Lep. Het. 2, p. 521. *Hab.*—China.

299. Setina accepta, n. sp. *Hab.*—Sarawak.

Primaries bright chrome-yellow; secondaries creamy whitish, with the apex and fringe yellow; thorax chrome-yellow, abdomen pale smoky-brown, anal tuft stramineous; primaries below with a broad, terminally clavate subcostal streak from the base to near the outer margin; internal area whitish; pectus greyish, legs and venter stramineous: expanse of wings 9 lines.

Allied to the two preceding species, but more nearly resembling a little species taken by the Rev. R. P. Murray at Zermatt, and which I have been hitherto unable to identify; it may be an immaculate and dwarfed example of *S. irrorella.*

300. Setina mesomella = Tinea mesomella, Linn. Syst. Nat. ii. p. 886. *Hab.*—Ratisbon.

Digitized by Google

301. Setina freyeri, Nickerl, Stett. Ent. Zeit. vi. p. 105. *Hab.*—Carinthian Alps.

302. Setina flavicans = Bombyx flavicans, Hübner, Bomb. figs. 344, 345. *Hab.*—South of France.

303. Setina irrorella = Tinea irrorella, Linn. Syst. Nat. ii. p. 885. *Hab.*—Europe.

304. Setina kuhlweinii = Bombyx kuhlweinii, Hübner, Bomb. figs. 290, 291. *Hab.*—North-east Germany.

305. Setina ramosa = Bombyx ramosa, Fabricius, Ent. Syst. iii. 1, p. 463. *Hab.*—Vevay, Switzerland.

306. Setina furcifera, Wlk. Lep. Het. 2, p. 520. *Hab.*—Tasmania.
Setina trifurcata, Wlk. l. c. Suppl. 1, p. 237.

307. Setina melanomos = Lithosia melanomos, Nickerl, Stett. Ent. Zeit. vi. p. 104. *Hab.*—Carinthian Alps.

308. Setina roscida = Noctua roscida, Denis & Schiff. Wien. Verz. p. 68. *Hab.*—Ratisbon.

309. Setina aurita = Noctua aurita, Esper, Eur. Schmett. iv. pl. xciv. fig. 1. *Hab.*—Swiss Alps.

NUDARIA, *Haworth.*

310. Nudaria dasara = Setina dasara, Moore, Cat. Lep. E. I. C. ii. p. 303. *Hab.*—Java.

311. Nudaria margaritacea, Wlk. Lep. Het. Suppl. 1, p. 275. *Hab.*—Darjeeling.

312. Nudaria floccosa, Wlk. Lep. Het. Suppl. 1, p. 274. *Hab.*—South India.

313. Nudaria mundana = Phalæna mundana, Linn. Syst. Nat. 1, 2, p. 812. *Hab.*—Europe.

314. Nudaria obliterata, Wlk. Lep. Het. Suppl. 1, p. 273. *Hab.*—Sierra Leone.

Digitized by Google

315. Nudaria albida, Wlk. Lep. Het. Suppl. 1, p. 273. *Hab.*—Moreton Bay.

316. Nudaria murina = Bombyx murina, Esper, Eur. Schm. iii. p. 491, pl. lxxxviii. cont. 9. *Hab.*—South of France.

317. Nudaria senex = Bombyx senex, Hübner, Bomb. pl. lv. figs. 236, 237. *Hab.*—England (*British Collection*).

318. Nudaria solita = Setina solita, Wlk. Lep. Het. 2, p. 521. *Hab.*—Ceylon.

COMACLA, *Walker.*

319. Comacla simplex = Pagara simplex, Wlk. Lep. Het. 7, p. 1679.
Comacla murina, Wlk. Lep. Het. Suppl. 1, p. 276.
Hab.—East Florida.

Paidia citrosa of Hübner appears to me to belong to this genus.

EUPHANESSA, *Packard.*

320. Euphanessa mendica = Nudaria mendica, Wlk. Lep. Het. 2, p. 576.
Eudule biseriata, Herrich-Schäffer, Lep. Exot. fig. 441. *Hab.*—United States, Nova Scotia, Trenton Falls.

Paidia transjecta looks as if it belonged to this genus.

DELPHYRE, *Walker.*

321. Delphyre hebes, Wlk. Lep. Het. 2, p. 537. *Hab.*—Honduras.

PAIDIA, *Herrich-Schäffer.*

322. Paidia mesogona = Callimorpha mesogona, Godart, Pap. de France, iii. p. 396, pl. xl. fig. 6. *Hab.*—Europe.

323. Paidia marginata = Nudaria? marginata, Wlk. Lep. Het. Suppl. 1, p. 274. *Hab.*—South India.

Digitized by Google

REPA, *Walker*.

324. Repa cana, Wlk. Lep. Het. Suppl. 5, p. 1898. *Hab.*—United States.

UXIA, *Walker*.

325. Uxia albida, Wlk. Lep. Het. Suppl. 5, p. 1897. *Hab.*—North America.

CINCIA, *Walker*.*

326. Cincia conspersa, Wlk. Lep. Het. 2, p. 538. *Hab.* —Jamaica.

MULONA, *Walker*.

327. Mulona lapidaria, Wlk. Lep. Het. Suppl. 5, p. 1896. *Hab.*—St. Domingo.

ÆMENE, *Walker*.

328. Æmene taprobanis, Wlk. Lep. Het. 2, p. 542. *Hab.*—Ceylon.

Panassa cingalesa, Wlk. Lep. Het. Suppl. 2, p. 607.

Autoceras grammophera of Felder may be this species, but I think it distinct.

329. Æmene sordida, n. sp. *Hab.*—South India.

Primaries whity-brown; two black dots at the base; two sub-basal blackish spots placed obliquely, followed by a sigmoidal transverse series, then a dot in the cell, followed by a central somewhat blurred bisinuated series of spots; an angular black discocellular spot, followed by an irregular oblique series of black dots; a subapical costal lunule; a submarginal series of black dots; the base of the fringe, opposite to the second and fifth of the submarginal dots, dusky; secondaries white with indistinct pale-brown marginal dots; fringe creamy; thorax whity-brown, abdomen greyish; primaries below greyish, the borders stramineous, the markings of the upper surface dimly visible; secondaries as above; pectus whitish, venter white: expanse of wings 8½ lines.

A somewhat allied species occurs in Japan.

* This and the four following genera are very nearly allied.

Digitized by Google

330. Æmene guttulosana = Tospitis guttulosana, Wlk. Lep. Het. 28, p. 429. *Hab.*—South India, Ceylon, East India, North India.

Primaries above creamy-whitish; two black spots placed obliquely near the base, followed at a short distance by four spots, the first and third large, the other two mere dots; a large spot on the centre of the costa, below which is a small dot in the cell; a dot on the inner margin in a line with the discoidal one and followed by two undulated interno-median transverse lituræ which are connected in the centre by a short longitudinal line; a large black spot closing the cell, and followed by a macular ε-shaped discal line; two subapical spots; a submarginal series of eight black dots; secondaries white, slightly greyish from the cell to the outer margin; thorax creamy-whitish, prothorax with two black dots partly covered by the tegulæ; abdomen greyish, with the two last segments white; wings below greyish, the markings dimly visible; the borders whitish; secondaries with a greyish discocellular spot, and a line of the same colour across the disc; body below creamy-whitish: expanse of wings 11 lines.

The more Northern examples are rather smaller and less distinctly marked than the Southern and Cingalese specimens.

SICCIA, *Walker*.

331. Siccia caffra, Wlk. Lep. Het. 2, p. 539. *Hab.*—South Africa, Knysna, Natal.

Melania punctigera, Felder, Reise der Nov. Lep. 4, pl. cvi. figs. 34, 35.

Felder's female is whiter than any that I have seen.

RŒSELIA, *Hübner*.

332. Rœselia confusalis, Herr.-Sch. Schm. Eur. ii. p. 164. *Hab.*—Germany.

333. Rœselia ancipitalis, Herr.-Sch. Schm. Eur. ii. p. 165, figs. 132, 133. *Hab.*—Europe.

334. Rœselia centonalis = Pyralis centonalis, Hübner, Pyral. pl. iii. fig. 15. *Hab.*—Germany.

335. Rœselia chlamydulalis = Pyralis chlamydulalis, Hübner, Pyral. 7, 1, pl. xxv. fig. 160; pl. xxviii. fig. 181. *Hab.*—Marseilles.

Digitized by Google

336. Rœselia cicatricalis = Hercyna cicatricalis, Treitschke, Schm. Eur. x. p. 3. *Hab.*—Ratisbon.

337. Rœselia strigulalis = Hercyna strigulalis, Treitschke, Schm. Eur. viii. p. 187. *Hab.*—Europe.

338. Rœselia togatulalis = Pyralis togatulalis, Hübner, Pyral. 7, 1, pl. xx. fig. 130. *Hab.*—Germany.

339. Rœselia cristulalis = Pyralis cristulalis, Hübner, Pyral. 8, 6, pl. iii. fig. 17. *Hab.*—Frankfort.

340. Rœselia palliolalis = Hercyna palleolalis, Treitschke, Schm. Eur. viii. p. 188. *Hab.*—Europe.

EUGOA, *Walker*. (Pl. VIII. fig. 6.)

341. Eugoa æqualis, Wlk. Lep. Het. 12, p. 768. *Hab.*—Sarawak.
Lyclene trifascia, Wlk. Journ. Linn. Soc. vi. p. 111.
Lyclene imposita, Wlk. l. c. p. 112.

342. Eugoa bipunctata = Lyclene bipunctata, Wlk. Journ. Linn. Soc. vi. p. 115. *Hab.*—Sarawak.
I was a long time in identifying this species, as Walker has omitted the very character for which he gave it the name; the primaries have two black dots in the discoidal cell between the two dark oblique lines.

343. Eugoa distributa = Lyclene distributa, Wlk. Journ. Linn. Soc. vi. p. 113. *Hab.*—Sarawak.
Lyclene vagigutta and *L. atrigutta* probably belong to *Æmene*.

SINNA, *Walker*. (Pl. VIII. fig. 12.)

344. Sinna extrema = Deiopeia extrema, Wlk. Lep. Het. 2, p. 573.
Teinopyga reticularis, Felder, Reise der Nov. Lep. 4, pl. cvi. fig. 18. *Hab.*—Shanghai.

345. Sinna calospila, Wlk. Lep. Het. Suppl. 2, p. 642. *Hab.*—Java.

Digitized by Google

ZERENOPSIS, *Felder.* (Pl. VIII. fig. 19.)

346. Zerenopsis leopardina, Felder, Reise der Nov. Lep. 4, pl. c. fig. 19. *Hab.*—South Africa.

347. Zerenopsis lepida = Deiopeia lepida, Wlk. Lep. Het. 2, p. 571. *Hab.*—Natal.

STENELOPSIS, nov. gen. (Pl. VIII. fig. 13.)

Allied to the preceding genus, but strangely resembling the *Dioptid* genus *Stenele.* It may readily be distinguished from that group (with which alone it could be confounded) by its more robust body, much longer palpi, the bladder-like drums at the base of the abdomen, the lower radial of primaries emitted near to the third median branch, the shorter secondaries, longer discoidal cell, the subcostal branches placed upon a footstalk, and the more angular discocellulars. Type, *S. exposita.*

348. Stenelopsis exposita, n. sp. *Hab.*—Pará.

Much resembling *Stenele translata;* wings cadmium-yellow; primaries with a sulphur-yellow longitudinal interno-median streak; a large black spot, excavated in front, at the end of the cell, followed by an irregular abbreviated cream-coloured band; outer border and apex broadly brown; a submarginal series of eight pale yellow spots, becoming elongate towards the costa; costal margin and internal vein blackish; secondaries with a large rounded black spot at the end of the cell; outer border and the greater part of the veins on the disc black-brown; subapical area and costa sulphur-yellow; crest of head white, with a central brown spot; vertex and collar brown, spotted with yellow; thorax dark brown, longitudinally streaked with yellow; abdomen chrome-yellow, the posterior half with central and lateral longitudinal dusky streaks, which converge towards the anus; wings below clearer in colour, the submarginal spots paler; secondaries with five or six small spots on the outer border; body below cream-coloured, legs streaked with brown: expanse of wings 2 inches 1 line.

349. Stenelopsis maculifrons = Stenele maculifrons, Wlk. Lep. Het. Suppl. 1, p. 157. *Hab.*—Limas.

Digitized by Google

PETOVIA, *Walker*. (Pl. VIII. fig. 7.)

350. Petovia dichroaria = Geometra dichroaria, Herrich-Sch. Lep. Exot. fig. 189. *Hab.*—Natal, Cape.

Confounded by Walker with the following, of which he regarded it as the female.

351. Petovia marginata, Wlk. Lep. Het. 2, p. 560. *Hab.*—Interior of South Africa.

PTEROODES, nov. gen. (Pl. VIII. fig. 20.)

Wings long and oval, the costal nervure of primaries terminating at second third of costal margin; the subcostal five-branched, the first two branches thrown off before the end of the cell, the third and fourth emitted from a long footstalk, below and near the base of which the fifth branch (answering to the upper radial) is emitted, discocellular arched inwards; lower radial and last two branches emitted almost from the same point at the inferior extremity of the cell; subcostal of secondaries three-branched, the first branch emitted before the end of the cell, the others from the same point at its superior extremity; discocellular in-arched, a false radial with recurrent continuation passing through its centre to the base of the cell; true radial emitted near the second and third medians as in primaries; body moderately slender and extending considerably beyond the secondaries; palpi long and porrect; legs long and rather slender, hind tibiæ with a short thick spine before their proximal extremity, and two still shorter at their extremity. Type, *P. longipennis*.

352. Pteroodes longipennis = Lithosia longipennis, Wlk. Lep. Het. 2, p. 510. *Hab.*—Mexico.

This singular species has much the form of the Rhopalocerous genus *Heliconius;* it forms an excellent transition to the next family—*Hypsidæ*.

SUPPLEMENTARY SPECIES.

353. Pallene gracilis, n. sp. *Hab.*—Sydney (Two specimens).

Primaries white, crossed just before the middle by a black γ-shaped band, slightly irregular and with its inner fork much more slender than the outer one; two black

Digitized by Google

dots below the angle of the band, almost converting it into an χ; the discoidal cell and interno-median interspace immediately beyond the band blurred with greyish scales; a large blackish subapical spot, just enclosing a small white costal spot at its upper interior angle; external angle divided off by an arched series of five blackish dots; outer margin greyish; a marginal series of minute black dots; fringe yellowish; secondaries stramineous, the fringe darker; discocellulars and apex grey; head and collar white; tegulæ with the basal half black, the apical half white; thorax black, with interrupted white posterior margin; abdomen stramineous; primaries below blurred with grey, the costa to the end of the cell broadly blackish; pectus greyish: expanse of wings 8 lines.

Intermediate in character between *P. transversa* and *P. aspectalella*. I found this species with the *Tineina*.

For Japanese species in the collection see Ann. and Mag. Nat. Hist. 4th Series, vol. xx. pp. 396—400.

EXPLANATION OF PLATE VIII.

Figs. 1, 2. Neuration of secondaries of *Chrysocale* ♂ and ♀.
3. „ „ *Œonistis basinota*.
4. „ primaries of *Calamidia*.
5. „ secondaries of *Argina*.
6. „ „ *Eugoa æqualis*.
7. „ „ *Petovia dichroaria*.
8. Male claspers of *Josioides celena*.
9. Neuration of secondaries of *Dianasa*.
10. „ „ and radiating brush of primaries in ♂ *Areva*.
11. „ „ of *Leptidula*.
12. „ „ *Sinna calospila*.
13. „ „ *Stenelopsis exposita*.
14. „ „ *Lemyra*.
15. „ „ *Bizone divakara*.
16. „ „ *Crambomorpha beema*.
17. „ „ *Tatargyna*.
18. „ „ *Tigrioides*.
19. „ „ *Zerenopsis lepida*.
20. „ „ *Pteroodes longipennis*.

Digitized by Google

Digitized by Google

XXIV. *Descriptions of New Species of the Coleopterous genus* Callirrhipis (*Rhipidoceridæ*) *in the British Museum.* By Chas. O. Waterhouse.

[Read November 7th, 1877.]

The determination of a species of *Callirrhipis* from the Andaman Islands has led me to examine the specimens of this genus in the British Museum Collection. I have found among them numerous undescribed species which are here characterized, and I have also made the following notes.

The males are always more or less pubescent above, and the antennæ are at least half the length of the entire insect, and with long slender branches, the length of which appears to vary slightly in the same species. The male organ is short, rather flattened, and presents at the apex three points, the two lateral ones slightly curved, acuminate and embracing the central smaller one.

All the females of species known to me are destitute of pubescence above; the antennæ are about as long as the head and thorax taken together, and have only short branches. The ovipositor is nearly as long as the entire abdomen, and the apex (which is frequently visible) presents two sharp points.

The small horny pieces ("pièce jugulaires") situated in ligament between the head and thorax seem to be for protection to the eyes when the head is withdrawn into the thorax; they are slightly woolly on the surface next the eye. It is strange that they should have only been observed in the American species. I have found them in all the species in both sexes.

I have not seen the female of any American species, and have only been able to match the sexes of one species from Borneo, that which I here name *Callirrhipis dissimilis;* but of the characterized species known to me from description I have little doubt that *C. Championi* of Westwood will prove to be the female of *C. Templetoni* of the same author. *C. orientalis,* Castelnau, will pro-

Digitized by Google

bably be the female (not the male as he suggests) of *C. javanica*, Casteln.

List of Species.

Callirrhipis	dissimilis, C. Waterh.	Callirrhipis	lineata, C. Waterh.
„	fasciata, „	„	costata, „
„	trepida, „	„	gausapata, „
„	stabilis, „	„	residua, „
„	Bowringii, „	„	suturalis, „
„	antiqua, „	„	cribrata, „
„	robusta, „	„	cyaneicollis, „
„	longicornis, „	„	reticulata, „
„	femorata, „	„	inconspicua, „
„	læta, „	„	simplex, „

I. Asiatic Species.

Callirrhipis dissimilis, sp. nov.

Elongata, parum convexa, fusca, dense pube flavo-grisea vestita; antennis ramis longissimis; thorace antice rotundato, supra utrinque puncto profundo, et postice impressionibus quatuor notato, dense evidenter punctato; elytris punctis profundis sat crebre dispositis, pube flavo-griseo tessellatis; antennis tibiis tarsisque brunneis.

Long. 8—9 lin.

Head somewhat rough above, very closely and distinctly punctured, the width in front half that of the head between the eyes. Antennæ (except the basal joint) dull brown, the basal joint thickly and distinctly punctured. Thorax one-third broader than long, a little narrowed and much rounded in front, convex anteriorly; the punctuation behind is fine and close, in front it is stronger and close, and the interspaces form rugulæ; on each side of the disk (a little behind the middle) is a deep punctiform impression; there are two small shallow impressions just over the scutellum, and a large shallow impression within the posterior angle; the posterior margin is rather strongly notched above the scutellum, and strongly sinuate on each side. The elytra sub-parallel for two-thirds their length, then narrowed to the apex, the dense pubescence being arranged in different directions gives them a tessellated appearance; there is a short oblique (scarcely visible) costa near the scutellum, two others (rather more distinct) unite a little before the apex, the lateral one is very obscure; the punctures on the surface are not very close, very deep and distinct, with a tendency to form lines at the sides. The abdomen has no impressions, the margins

Digitized by Google

of the segments (as well as the tibiæ and tarsi) are rather brown.

The antennæ in one specimen are a trifle shorter than in the others, but I can perceive no other difference, and have not the slightest doubt that they are all one species.

Hab.—Borneo (J. C. Bowring, Esq.). Brit. Mus.

The following is the description of the female:—

Elongata, robusta, picea, nitida, calva; capite crebre fortiter punctato, inter antennas sat profunde excavato; thorace ante medium angustato, antice obtuse rotundato, sat crebre punctato (punctis parvis atque majoribus intermixtis), intra angulos posticos impresso, disco utrinque fossâ profundâ ovatâ nitidâ, basi juxta scutellum impressionibus oblongis duobus; scutello subtiliter punctulato; elytris postice parum ampliatis, apice angustatis, sat crebre fortiter irregulariter punctatis, interstitiis lævibus, costis quatuor elevatis; abdomine distincte crebre punctato.

Long. 9 lin.; lat. $3\frac{3}{4}$ lin.

Antennæ as long as the head and thorax together. Head above deeply excavated between the antennæ, with a short longitudinal impression on the vertex. Thorax rather swollen at the sides before the posterior angles, convex in front, deeply impressed within the posterior angles (this impression longitudinally obscurely rugulose), very unevenly, rather thickly, and not very strongly punctured, and with extremely fine punctures intermixed; on each side of the disk is a deep fovea, and just above the scutellum are two shallow ill-defined impressions. The scutellum is rather raised in the middle and at the sides. Elytra thickly and strongly punctured, the intervals and costæ impunctate, the costæ are distinctly but not much raised, and the space between first and second is slightly concave. The punctuation of the abdomen, although rather fine, is very distinct.

Hab.—Borneo (J. C. Bowring, Esq.). Brit. Mus.

Of the following Species only the males are known to me.

C. fasciata, sp. nov.

Elongata, fusca, griseo-flavo-sericea; capite inter antennas bene angustato, longitudinaliter impresso; thorace antice angustato, medio paulo constricto, dense sericeo, subtiliter dense punctulato, utrinque puncto profundo, et basi juxta scutellum impressionibus duobus notato; elytris

Digitized by Google

subparallelis apice angustatis, brunneo-fusco velutinis, dimidio basali et fascia obliqua griseo-flavo-sericeis; abdominis segmentis 2° et 3° macula velutina notatis.

Long. 6—8½ lin.

Head above slightly concave, unusually narrowed between the antennæ, with a longitudinal impressed line, the pubescence forms a patch at the back, divided in the middle into two. Thorax much narrowed in front, distinctly constricted about the middle, rounded and convex in front; there is a deep punctiform impression on each side of the disk, two small shallow impressions next the scutellum, and an indication of an impression within the posterior angles. The punctuation of the elytra is extremely fine and difficult to see, but there are some large punctures scattered over the sides; the pubescence is dark velvety-brown, but all the basal portion is clothed with greyish-yellow silky pubescence (intermixed with brown in some lights), a little behind the middle is an oblique band of yellowish pubescence.

Hab.— Ceylon. Brit. Mus.

The description and figure of *C. Templetoni*, Westw., agree admirably with this species, but I cannot believe that Prof. Westwood could have omitted all mention of the silky bands on the elytra, which gives the insect such a marked character.

C. trepida, sp. nov.

Elongata, angusta, fusca, dense griseo-pubescens; thorace ante medium rotundato-angustato, creberrime evidenter punctato, utrinque impressionibus tribus parvis; elytris apicem versus attenuatis, costis vix conspicuis, subtilissime crebre punctulatis, punctis majoribus sat crebre irregulariter dispositis.

Long. 5⅓ lin.; lat. 1⅝ lin.

Head impressed between the eyes, very thickly and distinctly punctured; antennæ very long, the same length as the elytra. Thorax very closely and rather strongly punctured, convex and rounded in front, distinctly narrowed in front of the middle, the sides nearly parallel near the posterior angles, which are consequently nearly right angles, the base not very strongly sinuate on each side, slightly lobed over the scutellum, the lobe truncate; on each side of the disk there is a small not very distinct

Digitized by Google

punctiform impression, two others just above the scutellum, and the space within the posterior angles is also slightly impressed. Elytra attenuated from about the middle, very finely and closely punctured, and large punctures are rather thickly irregularly scattered over the surface, more especially visible towards the sides. Abdomen very finely and thickly punctured, the fifth segment rather less closely, very slightly emarginate at the apex.

Hab.—Batchian. Brit. Mus.

One example has the elytra rather brownish.

C. stabilis, sp. nov.

Elongata, postice attenuata, fusca, flavo-griseo-pubescens; thorace antice bene rotundato, creberrime evidenter punctato, lateribus arcuatis, disco utrinque fossâ sat profundâ, basi juxta scutellum punctis duobus notatâ; elytris postice angustatis (costis parum elevatis), crebre fortiter seriatim punctatis, interstitiis crebre subtilissime punctulatis.

Long. $5\frac{1}{2}$ lin.; lat. $1\frac{2}{3}$ lin.

Very close to the preceding, but rather broader in form, more attenuated posteriorly. Antennæ rather shorter, five-sixth the length of the elytra. Thorax a little broader, entirely rounded in front, with no distinct constriction in front of the middle, the sides regularly arcuate from the posterior angles; the fossæ on the disk are deep and rather large, the small impressions next the scutellum are shallow, the space within the posterior angles is slightly impressed; the base is rather more sinuate on each side, and the mesial lobe is very slightly emarginate. The costæ on the elytra are indistinct; the large punctures are rather close and more distinct (even on the dorsal region), and towards the sides they form irregular lines; the punctuation of the interspaces is extremely fine and much less close than in the preceding species, so that the elytra are more shining; the pubescence is more sparse. The abdomen is very finely and closely punctured, but the fifth segment is much less closely punctured at the base, and the apex is rounded.

Hab.—Ceram. Brit. Mus.

C. Bowringii, sp. nov.

Elongata, sat lata, postice angustata, fusca, flavo-griseo-pubescens; thorace fere semicirculari, crebre fortiter

Digitized by Google

punctato, fossis quatuor haud profundis impressis; elytris apicem versus gradatim attenuatis, sat crebre fortissime lineato-punctatis, interspatiis haud crebre subtilissime punctulatis, nititis, costis haud conspicuis.

Long. 6½ lin.; lat. 2¼ lin.

Relatively broader than the preceding, and more gradually attenuated behind. The antennæ are relatively shorter, being five-sevenths the length of the elytra. The thorax is nearly semicircular, very thickly and strongly punctured; there is on each side an oblique shallow impression (formed by the uniting of the usual discoidal fossa and the impression within the posterior angles); there are two small impressions near the scutellum, the base is sinuate on each side, the mesial lobe is rather broad and not emarginate. Scutellum clothed with yellowish pubescence. Elytra much attenuated, very strongly and rather closely punctured in tolerably well-defined lines, the interspaces are extremely, finely and rather sparingly punctured; the costæ are scarcely visible.

The punctuation is much stronger than in the preceding species.

Hab.—Penang (J. C. Bowring, Esq.). Brit. Mus.

C. antiqua, sp. nov.

Elongata, postice attenuata, obscure fusca, dense flavo-griseo-pubescens; thorace antice parum angustato et rotundato, creberrime evidenter punctato, impressionibus quatuor parum distinctis; elytris sat crebre fortiter punctatis, interstitiis crebre subtilissime punctulatis.

Long. 7½ lin.; lat. 2⅔ lin.

Antennæ two-thirds the length of the elytra, fuscous. Thorax gradually (but not much) narrowed anteriorly from the base, regularly rounded in front, not constricted in the middle, distinctly and very thickly punctured; the dorsal impressions are not deep, the two on the disk and the pair next the scutellum moderately distinct, the impression within the posterior angles scarcely perceptible. The punctuation of the elytra is very strong, but the punctures are not so large as in *C. occultus*, and they do not form lines, the interspaces are very finely and thickly punctured.

Hab.—Philippine Islands. Brit. Mus.

This species is close to *C. Boworingii*, but is less narrowed

Digitized by Google

posteriorly, the thorax is not so short, and is a little narrowed from the posterior angles forward. The punctuation of the elytra is less strong and not in lines.

C. robusta, sp. nov.

Elongata, convexa, fusca, flavo-griseo-pubescens; thorace antice omnino rotundato, creberrime sat fortiter punctato, supra impressionibus quatuor haud profundis; elytris sat convexis parallelis apice arcuatim attenuatis, crebre fortiter irregulariter punctatis, interstitiis crebre subtilissime punctulatis, costis vix conspicuis.

Long. 6¾ lin.; lat. 2⅓ lin.

Rather a robust species, rather convex, more parallel in the elytra, only narrowed at the apex. Antennæ three-fourths the length of the elytra. Thorax scarcely narrowed anteriorly, rounded in front (the sides not much arched), very thickly and rather strongly punctured; the two discoidal impressions and those near the scutellum not very large and rather shallow, the impression within the posterior angle is very slight and ill-defined; the base is very little sinuate on each side, the mesial lobe broad and very little prominent, slightly emarginate. Elytra rather convex, thickly, strongly and irregularly punctured, the interspaces thickly and very finely (but distinctly) punctured. The antennæ, tibiæ and tarsi are (as usual) rather more brown than the rest of the insect. The elytra present numerous elongate impressions in different directions, which give them a pleated appearance. This seems to be natural, but having only a single example it may possibly be accidental.

Hab.—Siam. Brit. Mus.

C. longicornis, sp. nov.

Valde elongata, subdepressa, fusca, brevissime flavo-griseo-pubescens; antennis corpore vix brevioribus; thorace antice rotundato, ad medium lævissime sinuato, confertim subtiliter punctato, impressionibus quatuor notato; elytris elongatis parallelis apice angustatis, crebre irregulariter minus fortiter punctatis, interstitiis subtiliter obsolete punctulatis.

Long. 7¼ lin.; lat. 2 lin.

Distinct from all the preceding by its very elongate

Digitized by Google

rather depressed form, and by the length of the antennæ which are as long as the thorax and elytra together. The punctuation of the elytra is strong but the punctures are not very large; the punctuation of the intervals is very fine and difficult to see. There are no distinct costæ.

Hab.—Andaman Is. (R. Meldola, Esq.).

C. femorata, sp. nov.

Elongata, robusta, convexa, nitida, fusca, breviter ferrugineo-pubescens; antennis ferrugineis; thorace antice arcuatim angustato, creberrime evidenter punctato, impressionibus quatuor haud profundis notato; elytris convexis, subparallelis apice arcuatim attenuatis, piceis, creberrime fortiter rugoso-punctatis, interstitiis fere lævibus, costis quatuor parum elevatis; femoribus quatuor posticis subtus dense flavo-tomentosis.

Long. 8 lin.; lat. 2⅔ lin.

A convex, robust species with coarsely sculptured elytra; at once distinguished from all the foregoing by having a patch of pale pubescence on the underside of the four posterior femora. Antennæ six-sevenths the length of the elytra, the basal joint unusually slender. The thorax is nearly twice as broad as long, much narrowed and rounded in front, broadest immediately before the posterior angles; the punctuation is rather strong, very close and distinct; there is a broad shallow impression in the middle in front and another next the scutellum, united by an ill-defined longitudinal channel; there is also a well-marked rather large impression within each posterior angle. The punctures on the elytra are very deep and close (not quite confluent), the interspaces very shining (only presenting a few fine punctures).

Hab.—Samoa Is. (Rev. S. J. Whitmee). Brit. Mus.

C. læta, sp. nov.

Elongata, angusta, flavo-rufa, subopaca rufo-pubescens; antennis et femorum tibiarumque apicibus nigrescentibus; capite confertim fortiter punctato, inter antennas impresso; thorace antice arcuatim angustato, convexo, confertim fortiter punctato; scutello fere lævi, basi constricto; elytris creberrime fortiter multi-seriatim punctatis, interstitiis

Digitized by Google

angustis, sub-interruptis, lævibus; corpore subtus tenue flavo-pubescenti.

Long. 5⅔ lin.; lat. 1½ lin.

General appearance of *Campylus linearis*, reddish-yellow. Head thickly and roughly punctured, with a transverse impression between the eyes, the deflexed portion in front of the antennæ forming an obtuse angle with the upper surface. Antennæ very dark ferruginous. Thorax broadest at the posterior angles, rather narrowed anteriorly, bluntly rounded in front, with a lightly-impressed mesial line, deeper and broader near the scutellum, and on each side of the disk a not very distinct oblong fovea, there is an indication of an impression within each posterior angle. Scutellum nearly smooth, strongly constricted at the base, spade-shaped. Elytra long and narrow, nearly parallel, each with about nine lines of strong transverse punctures, the interstices narrow, rather irregularly costiform, shining. The apices of the femora and tibiæ are blackish; the extreme base of the thorax and the extreme base of the elytra are narrowly bordered with black.

Hab.—Sylhet (J. C. Bowring, Esq.). Brit. Mus.

C. lineata, sp. nov.

Rufo-picea, nitida; thorace, elytrorum suturâ et costis, corporeque subtus albido-pubescentibus; thorace sat crebre evidenter punctato; elytris crebre sat fortiter lineato-punctatis.

Long. 5 lin.; lat. 1½ lin.

Head gently convex, not very thickly but very distinctly punctured, with a small smooth spot on the forehead, rather deeply impressed between the antennæ. Thorax one-third broader than long, very little narrowed anteriorly, bluntly rounded in front, broadest at the posterior angles, the punctuation is very distinct but not very strong, the usual discoidal and basal impressions are lightly marked, there is no impression within the posterior angles which are scarcely less than right angles. The elytra are convex, the punctuation is strong and forms lines, the suture, a short scutellar costa and the first dorsal costa are clothed with whitish pubescence.

Hab.—Borneo. Brit. Mus.

Digitized by Google

Of the following Species only the females are known to me.

C. costata, sp. nov.

Elongata, crassa, nigro-fusca, calva; thorace nitido, sat crebre subtiliter punctulato, intra angulos posticos impresso, disco utrinque fossâ rotundatâ; elytris quadricostatis, subopacis, subtiliter coriaceis, sat crebre punctulatis; abdomine creberrime subtilissime punctulato.

Long. 14 lin.; lat. 5 lin.

Antennæ as long as head and thorax together, ferrugineous except the basal joint. Thorax very convex and shining, distinctly swollen before the posterior angles (which are nearly right angles), the surface finely and not very thickly punctured; on each side of the disk is a rather deep round fossa, and in front of each (near the anterior angles) is an indication of another; the usual two impressions near the scutellum are rather large but slightly indicated, the impression within the posterior angles is rather deep. The scutellum is slightly cordiform, nearly smooth. Elytra somewhat opaque, finely coriaceous and rather thickly punctured, but the punctures are very small and irregular, the costæ are moderately raised and shining, the space between the first and second slightly concave.

Hab.—Fiji Is.? (Macgillivray). Brit. Mus.

C. gausapata, sp. nov.

Elongata, robusta, convexa, nitidula, obscure picea, calva; thorace nigro nitido, antice arcuatim angustato, convexo, crebre subtiliter punctato, disco utrinque puncto impresso, angulis posticis acutis supra haud impressis; elytris convexis, crebre irregulariter sat fortiter punctatis, interstitiis creberrime subtiliter punctatis, costis fere nullis; abdomine creberrime evidenter punctulato.

Long. 12½ lin.; lat. 4 lin.

Head very thickly, coarsely and rugosely punctured, with no longitudinal impression behind, deeply impressed above between the antennæ, the deflexed portion in front deeply longitudinally impressed (narrower above than below), so that there is a well-marked ridge over the base of each antenna; antennæ dull rusty, as long as head and thorax together. Thorax convex, broadest at the posterior angles, narrowed and rounded in front, regularly arcuate at the sides, rather thickly and finely (but dis-

Digitized by Google

tinctly) punctured; disk with a small round punctiform impression on each side; base with two very slight impressions near the scutellum, with no impression within the posterior angles, which are consequently convex above. Scutellum extremely finely and thickly punctulate, lightly impressed on each side at the base. Elytra thickly and rather strongly punctured, the punctures star-like, occasionally connected, the interspaces very thickly and finely but distinctly punctured; the costæ scarcely noticeable. Abdomen very thickly and distinctly punctured.

Hab.—Burmah (J. C. Bowring, Esq.). Brit. Mus.

C. residua, sp. nov.

Convexa, nitida, calva, picea; thorace brevi parum convexo, crebre sat fortiter punctato, disco utrinque fossâ parum profundâ notato, basi juxta scutellum fossis duabus impressâ; elytris crebre irregulariter sat fortiter punctatis, interstitiis lævibus; abdomine minus crebre tenue punctulato.

Long. 10½ lin.; lat. 3⅓ lin.

Head thickly and strongly punctured, less closely on the forehead, which is longitudinally impressed, the fore part bi-impressed between the antennæ, the deflexed portion in front of the antennæ a little broader than long, nearly straight above, not longitudinally impressed. Thorax short, only convex in front, a little narrowed anteriorly, bluntly rounded in front, broadest at the posterior angles, thickly and moderately strongly punctured, the punctures smaller near the base; on each side of the disk is a rather deep ill-defined fossa and two similar ones near the scutellum, there is also a shallow impression within each posterior angle which is a little less than a right angle. Elytra rather thickly and strongly punctured, the interspaces smooth; the four usual costæ are scarcely visible. The punctuation of the abdomen is moderately thick and very delicate.

Hab.—Java. Brit. Mus.

C. suturalis, sp. nov.

Elongata, parum convexa, picea, calva; thorace brevi, leviter convexo, antice rotundato, sat crebre evidenter punctulato, disco utrinque fossâ rotundatâ, basi intra

Digitized by Google

angulos posticos late impressâ et juxta scutellum fossis duabus; elytris piceis (suturâ marginibusque fuscis), sat crebre distincte punctatis, costis fere nullis.

Long. 7—8 lin.

Elongate-elliptical, reddish-pitchy, with the suture and margins of the elytra fuscous. Antennæ as long as head and thorax together. Head rather thickly and not very strongly punctured, distinctly impressed on each side close to the eyes and deeply between the antennæ; there is an elongate fovea on the forehead; the deflexed portion forms an obtuse angle with the upper portion (*i. e.*, it is not so suddenly deflexed as usual), it is rather small, broader than long, and has a slight transversely-impressed line. Thorax a little narrowed and rounded in front, gently convex, rather thickly and finely (but distinctly) punctured, the usual discoidal impressions and the pair next the scutellum are distinct in one example and rather obsolete in the second; the impression within the posterior angles is wide but indistinct; the posterior angles are a little less than right angles. Scutellum extremely delicately punctured. Elytra rather thickly and very distinctly (but not very strongly) punctured [the larger specimen has the elytra more strongly punctured], the interspaces smooth; the costæ are very indistinct.

Hab.—Penang (J. C. Bowring, Esq.). Brit. Mus.

C. cribrata, sp. nov.

Piceo-castanea, calva, nitida; capite convexo, inter antennas vix impresso, crebre sat fortiter punctato; thorace antice angustato, basi perparum ampliato, convexo, crebre sat fortiter punctato, medio antice posticeque leviter impresso, disco utrinque foveolâ notato; elytris crebre fortissime lineato-punctatis, punctis transversis, interstitiis lævibus subcostiformibus; abdomine crebre subtiliter punctulato.

Long. 7 lin.; lat. 2 lin.

Thorax narrowed in front, a little swollen at the posterior angles (which are nearly right angles), the greatest width being a little before the angles; the punctuation is not very strong but very distinct, rather close; there is a slight longitudinal mesial impression in front, the usual pair at the base (not very distinct), and the usual small fossa on each side of the disk; there is no distinct impression within the posterior angles. Scutellum almost im-

Digitized by Google

punctate. Elytra very strongly punctured, the punctures deep and transverse (each formed of two confluent punctures), and are in lines, the intervals shining and smooth, the three near the suture almost costiform.

Hab.—Borneo, Sarawak. Brit. Mus.

C. cyaneicollis, sp. nov.

Elongata, nigro-cyanea; thorace cyaneo, antice angustato, sat crebre distincte punctulato, medio longitudinaliter impresso, disco utrinque foveolâ notato; scutello transverso, subtiliter punctulato; elytris convexis, purpureo-cyaneis per fortiter reticulato-punctatis, interstitiis lævibus, costis quatuor sat elevatis nitidis vix parce punctulatis; corpore subtus brevissime griseo-pubescenti.

Long. 9 lin.; lat. 2¾ lin.

Head very coarsely and rugosely punctured. Antennæ as long as the head and thorax together. Thorax one-fourth broader than long, regularly narrow anteriorly from the posterior angles which are acute, not very thickly nor strongly punctured, the sides straight, the anterior margin arched, incrassated; there is a lightly impressed mesial line, on each side of the base of which are the two usual shallow impressions near the scutellum; on each side of the disk there is a small round fovea. Scutellum twice as broad as long, a little narrower at the base, rounded at the angles, truncate at the apex. Elytra gradually (but not much) enlarged to near the apex, and then narrowed again, very strongly and thickly punctured, the punctures with a small puncture in the middle of each, the intervals forming a sort of irregular network; each elytron has four distinct costæ, which are shining and with very few fine punctures. The underside of the insect is dull, very finely and closely punctured.

Hab.—India (J. C. Bowring, Esq.). Brit. Mus.

C. reticulata, sp. nov.

Nigra, subnitida; thorace crebre fortiter punctato, medio longitudinaliter impresso; scutello rotundato; elytris crebre fortiter punctatis, singulis costis quatuor nitidis a carinis transversis hic et illic conjunctis; corpore subtus creberrime subtiliter punctulato, brevissime pubescenti.

Long. 7½ lin.; lat. 2⅓ lin.

Head thickly and rugosely punctured; antennæ a little

Digitized by Google

longer than the head and thorax together; palpi pale pitchy. Thorax one-third broader than long, rather narrowed in front, very thickly and coarsely punctured, with a well-marked mesial impressed line, and two distinct oblong impressions near the scutellum; anterior margin arched, slightly bordered; the posterior angles acute; the sides a little rounded in front. Surface of the elytra very uneven, deeply and rather thickly punctured, the intervals between the punctures shining and raised; each elytron has four rather irregular costæ, which are united at irregular intervals by transverse costæ.

Hab.—India (Bombay?). Brit. Mus.

II. South American Species.

C. inconspicua, sp. nov.

Elongata, subdepressa, fusca, tenue pubescens; antennis (articulo basali excepto), corpore subtus, tarsisque rufo-ferrugineis; capite sat crebre evidenter punctato; thorace longitudine ¼ latiori, antice convexo, rotundato, postice ampliato, creberrime fortiter punctato, lineâ medianâ distincte impressâ haud basin attingenti, postice utrinque fortiter oblique impresso; elytris crebre evidenter punctatis, costis nitidis sat elevatis. ♂.

Long. 7½ lin.; lat. 2½ lin.

Head with rather strong punctures, not very close together. Thorax considerably narrowed in front, enlarged at the posterior angles (which are nearly right angles), very closely and rather rugosely punctured in front, more finely behind; there is a well-marked mesial line (which does not extend to the base), there is a rather deep wide fovea on each side of the disk, which being united with the usual impression within the posterior angle forms a well-marked oblique impression on each side, there is also an impression near the scutellum. The elytra are a little less dark than the head and thorax, rather closely and very distinctly punctured; each elytron has three distinct costæ.

Hab.—Brazil. Brit. Mus.

C. simplex, sp. nov.

Elongata, convexiuscula, sat parallela, fusca, tenue pubescens; antennis (artº primo excepto), corpore subtus tarsisque rufo-ferrugineis; capite convexo, crebre distincte

Digitized by Google

punctato; thorace postice longitudine vix latiori, convexo, antice parum angustiori, crebre sat fortiter punctato, ante medium lineâ medianâ impresso; elytris crebre sat fortiter punctatis, costis sat elevatis. ♂.

Long. 7 lin.; lat. $2\frac{1}{3}$ lin.

Rather a convex cylindrical species, with the thorax not much enlarged behind. Head rather convex, with a short impressed line on the vertex and a transverse deep fovea just before the base of the antennæ; the punctures are rather strong, very close but not crowded. Thorax gradually and not much narrowed in front (not suddenly enlarged at the posterior angles), convex, very thickly and rather strongly punctured; there is a short impressed line in front, and a shallow round impression near the scutellum, the space within posterior angle shallowly excavated. Elytra very distinctly and rather closely punctured, the punctures rather unequal in size; each elytron with four moderately distinct costæ, the lateral one not extending to the shoulder.

Hab.—Rio. Brit. Mus.

C. Laportei, Hope, var.

Testaceo-rufa, sub-opaca, tenue pubescens; antennis, thoracis maculâ discoidali, tibiis tarsisque nigris; capite crebre rugoso-punctato; thorace antice parum angustato, crebre rugoso-punctato, disco utrinque foveolâ notato; elytris crebre fortiter punctatis, costis nitidis elevatis. ♂.

Long. 6 lin.; lat. $1\frac{2}{3}$ lin.

Head and thorax densely, rather finely and rugosely punctured, the former with a small black spot on the vertex, the thorax with a black spot in the middle. Thorax gradually and not very much narrowed in front, the front margin arched; the discoidal foveæ are not very distinct. Elytra very thickly and strongly punctured; each elytron with four distinct shining costæ, the third extending a little beyond the middle, the fourth obliterated near the shoulder.

Hab.—Nicaragua. Brit. Mus.

I have determined the above to be a variety of *C. Laportei*, Hope (T. E. S. iv. p. 181); but besides the different coloration of the elytra it has the basal joint of the antennæ black, which inclines me to think that it may prove to be a distinct species.

Digitized by Google

Digitized by Google

XXV. *Descriptions of a new genus and two new species of* Sphingidæ, *with general remarks on the family.* By Arthur G. Butler, F.L.S., F.Z.S., &c.

[Read 7th November, 1877.]

Mr. Kirby having kindly placed in my hands for description a beautiful new genus of the sub-family *Macroglossinæ*, I take this opportunity of more fully characterizing my genus *Himantoides*, and also of answering some of the remarks which Mr. Kirby has made respecting my revision of the *Sphingidæ*.

Himantoides, Butler. (Pl. IX. fig. 1.)

Allied to *Perigonia*, but the wings much shorter and broader, the secondaries more rounded, scarcely perceptibly excavated above the anal angle, not sinuated; eyes less prominent though quite as large; antennæ considerably longer (so that if thrown back they would reach to the middle of the abdomen), of the male thicker, of both sexes with the terminal hook of nearly twice the length. Type, *Himantoides undata*, Wlk.

The example described by Walker consists of the head, with one antenna, the thorax and the primaries of a female example; a second specimen (a male), was presented to the collection towards the end of the year 1876 by Mr. F. B. Sturridge; it differs from the female in the absence of all the blackish bands and lines, excepting one which tapers from near the apex to the second median branch, forming a partial boundary to the outer border; the secondaries are deep orange with a large triangular interno-basal spot and a broad almost marginal band of chocolate-brown; the abdomen seems to have the general coloration of the thorax, but the specimen is rubbed: expanse, 1 inch 9 lines.

Hab.—Jamaica. Type, B. M.

Mr. Kirby quotes one or two instances in which I have missed Boisduval's recent species. I am not surprised because the book arrived in England after my paper was

Digitized by Google

completed, and I was compelled to add the species *at once* in an Appendix; in hastily copying down such names as *Sphinx jasmini* and *Sphinx jasminearum* in juxtaposition one is very likely to write both names alike, and subsequently when going through the press the duplicate name would naturally be erased.

I cannot quite comprehend Mr. Kirby's meaning with regard to the synonymy of *Calliomma pluto;* unless it be that the species described by Fabricius is not the insect figured by Cramer, but the *Oreus thorates* of Hübner, which appears from the description in the Genera Insectorum, to be the true state of the case. Mr. Kirby says, on the authority of specimens of *Acosmeryx Miskini* in Herr Maassen's Collection, that *Enyo cinnamomea* of Herrich-Schäffer is probably an over-coloured figure of this species and should take priority. Whilst giving Mr. Kirby credit for referring Herrich-Schäffer's species to its true genus, I much regret that he relies upon the authority of Herr Maassen, who, although he has favoured me with a letter in which he informs me that I am "an ass," is, I think, on that account, none the better qualified to determine the allied species of Lepidoptera. *A. Miskini* is not only half as large again in both sexes as *A. cinnamomea*, but has an entirely different pattern on the wings, and is the dullest of all the species of the genus; the wings are also much broader and less produced. *If* Herrich-Schäffer's figure *were* intended for Murray's species, I would simply ignore it, as being below the average of the Entomological drawings used to paper toys and boxes of sweets; but, knowing how excellent the other illustrations of this author are, I have not a shadow of a doubt that the species represented is abundantly distinct.

I can say nothing respecting the *A. daulis* of Boisduval as I have not seen the type.

Otus versicolor, Harris.

The name *Otus* being preoccupied, Mr. Grote proposes to adopt Boisduval's generic name *Everyx*.

The names in Delegorgue's Voyage being, with one exception, unaccompanied by description, can take no precedence over Walker's.

Chærocampa butus, H.-S., is allied to *C. lucasii* and perfectly distinct from my *C. punctivenata*.

Mr. Kirby gives *Sphinx porcus*, Retz., as a synonym of

Digitized by Google

C. elpenor; should not *Oreus porcus*, Hübn., therefore, take another name? I am very glad to see that M'Leay's species are at last identified; I could make nothing of the descriptions myself, but shall be glad to adopt Mr. Kirby's determination, and thus lay them on the shelf, though I cannot guess how he made them out.

Pachylia lyncea is hardly likely to be identical with the species which I have diagnosed from Haiti; still, as Mr. Kirby says, it *may* be.

The drawing of *P. Kadeni*, Schauf., which Mr. Kirby kindly sent me for examination (and of which I took a copy), is, I should say, identical with Cramer's *P. achemenides*, and probably with Walker's *Oryba robusta*; in my Revision I adopted Hübner's name, *Clanis*, for *P. achemenides*, but if this species be the same as or congeneric with *Oryba robusta*, the genus *Basiana* of Walker must necessarily fall before *Clanis* (not because Hübner's two first species of *Clanis* are referable to Walker's genus *Basiana*, but because *Oryba* was first characterized).

At page 239 Mr. Kirby says, "The following five *Sphinges* are not noticed by Butler;" he then enumerates, first, *S. pagana*, Fabricius, and says, "The type should be in the Banksian Collection." I must call his attention to page 596 of my Revision, where this species is quoted in full as a synonym of *Basiana phalaris*, and the following statement occurs with it:—"The type of *S. pagana* of Fabricius is in the Banksian Collection in the British Museum."

The second species, *S. jasmini* of Boisduval, was doubtless wrongly copied in my list of that author's species, and subsequently erased, as already explained.

The third species, *Sphinx orneus* of Westwood, is, I admit, a careless oversight; it appears to be referable to *Everyx*.

Sphinx sanguinosa of Martyn, the fourth species, is a true *Zygænid* (referable to *Empyreuma lychas*, Fabr.); and the fifth species, *Sphinx argentiflora*, is a *Zygænoid Arctiid* of the genus *Charidea*.

I now proceed to the description of new forms:—

Macroglossinæ.

Hypædalea, nov. gen.

Allied to *Lophura*, but the wings considerably broader, in form more nearly like *Pachygonia*; the abdomen gradually expanding from its base backwards, abruptly

Digitized by Google

rounded off behind and terminating in a pencil of stiff hairs; primaries subtriangular, produced at apical and external angles, excised below the apex, inner margin gently excavated from the external angle to the middle, and less markedly from the middle to the base; costal vein terminating a short distance beyond the cell, subcostal emitting two branches before the end of the cell, third branch emitted from the end of the cell and forked, the upper furcation running (close to the second subcostal branch) to apex, upper radial emitted from the base of the third subcostal branch; discocellulars oblique, slightly convex; secondaries with very convex (almost angular) costal margin, outer margin straight, meeting the abdominal margin at an angle rather greater than a right angle; costal vein running from the base to near the apex at a great distance from the costal margin, subcostal vein running close to the costal but continued to apex, forking just beyond the cell, the latter short, discocellulars convex, angular; second and third median branches emitted rather near together; palpi thick, hairy, abruptly truncated, the terminal joint extremely short; eyes metallic. Type, *H. insignis*.

Hypædalea insignis, n. sp. (Pl. IX. figs. 3, 3*a*, 3*b*.)

Alæ anticæ supra rufo-fuscæ, nigro, rufo et testaceo marmoratæ et striatæ; plaga distincta ovali interna, albo partim marginata; posticæ fuliginosæ, area basali albicante, plaga apud apicem albida antice rufescente; thorax rufescens tegulis lateraliter rufis; abdomen ochreum, segmentis tribus analibus et cristula media basali, nigris; alæ subtus purpureo-fuscæ ad basin croceæ; anticæ costa apicali ochrea, area subcostali apicali pruinosa; area interna albida; posticæ tertia parte basali crocea; corpus subtus croceum, pectore postice albicante, ventre lateraliter fusco notato; oculis æneis: exp. alar. unc. 2, lin. 6.

Hab.—Sierra Leone.

Type in Coll. Royal Dublin Soc.

One of the most singular of the *Sphingidæ*, exhibiting affinities to *Lophura*, *Pachygonia*, *Rhodosoma* and *Sataspes*.

Chærocampinæ.

Chærocampa Walduckii, n. sp. (Pl. IX. fig. 2.)

Coloribus et aspectu *C. lucasii*, alis autem multo latioribus; anticis magis griseis, striis obliquis minus

Digitized by Google

distinctis, puncto nullo discocellulari; posticis pallidioribus magis griseis, margine toto externo pallide roseo-fusco apud angulum analem late intus diffuso; capite tegulisque magis olivaceis; abdomine roseo-fusco paululum lutescente, lateraliter pallidiore, haud albido; lineis nullis obscurioribus (velut in *C. lucasii*); alis subtus non distincte notatis, coloribus autem *C. lucasii;* pectore paululum fuscescente, ventre roseo-tincto: exp. alar. unc. 3, lin. 4.

Australia (*Du Boulay*). Type, B. M.

This species comes nearest to the Javan form which I considered, in my Revision, to be the *C. cyrene* of Westwood; Mr. Moore has, however, shown me that the latter is closely allied to if not a variety of *C. clotho;* the *C. rhesus* of Boisduval from the Philippines seems to me to be the same as the species from Java, the latter may therefore provisionally bear that name. From *C. rhesus* of Java, then, my new species may be distinguished by its greatly superior size, deeper coloration, the absence of a dorsal abdominal line or the black dot at the end of the cell of primaries, the redder and more blurred pale border of the secondaries, and the redder and less distinctly marked under-surface.

The type of this species has recently been presented to the Collection by H. Walduck, Esq., to whom it was given in Queensland by Mr. Du Boulay. It was probably captured in Western Australia.

Digitized by Google

Digitized by Google

XXVI.—*Descriptions of new species of* Cleridæ, *with notes on the genera and corrections of synonymy.* By the Rev. H. S. Gorham.

(*Continued from p.* 263.)

[Read November 7th, 1877.]

List of New Species.

Tenerus Parryanus.
" siamensis.
" cruentatus.
" ceramensis.
" javanus.
" flavicollis.
" cyaneus.
" chalybæus.
" doreyanus.
" andamanensis.
" fuscipennis.
" discolor.
" mindanaonicus.
" difficilis.
" incertus.
" persimilis.
" apicalis.
" melanurus.
Ichnea funesta.
" subfasciata.
" mitella.
" disjuncta.
" mimica.
" Batesiana.
Ichnea, *var.?* peloniodes.
" plumbea.
" incerta.
" fumigata.
" obscura.
" impressocollis.
" Fryana.
" vitticollis.
" nitida.
Pyticera flavicollis.
" coronata.
Pelonium optabile.
" ruficolle.
" semirufum.
" Badeni.
" difforme.
" bipunctatum.
" micans.
" irroratum.
" ridens.
" pictipenne.
" confluens.
" maculosum.
Pelonium ? extraneum.

V.—ENOPLIIDES.

Synopsis of Genera.

A. Tarsi with four joints visible above.
a. Antennæ nine-jointed .. .. .. *Apolopha.*
aa. Antennæ eleven-jointed.
b. Antennæ, joints 3 or 4 to 11, serrate.
Legs straight .. .. *Tenerus.*
Legs bent .. .. *Prionophorus.*
bb. Antennæ, joints 9, 10, 11, large.

Digitized by Google

A. Tarsi with four joints visible above—*continued.*

c. Antennæ, joints 3—8 reduced, transverse, indistinct.

Palpi obconic, or but little hatchet-shaped	*Ichnea.*
Palpi hatchet-shaped, elytra widened behind	*Platynoptera.*
Elytra ovate	*Pyticera.*
cc. Antennæ with joints 3—8 obconic	*Chariessa.* *Pelonium.* *Cregya.* *Phymatophæa.*

AA. Tarsi with three joints only visible above.

Palpi obconic	*Orthopleura.*
Palpi hatchet-shaped	*Enoplium.*

Tenerus, Castelnau.

Type, *T. præustus*, Cast.

A very natural genus, and widely distributed in the Old World tropics. The great majority of the species yet known are from the Malay Isles.

M. Chevrolat's remark [Mém. 1876, p. 37, note] on the supposed synonymy of *Stenocylidrus*, Spin., with this genus is based on some error, the type of the former being *Xylobius azureus*, Klug.

Tenerus Parryanus, n. sp.

Ruber, supra dense pubescens, corpore toto subtus, prothoracis lateribus, antennis, pedibusque nigris, elytris quadri-costatis, costis ante apicem desinentibus.

Long. 7½ lin.

Nearly allied to *T. cingalensis*, White, from which it differs in having the elytra without any apical spot, the sides of the thorax and the underside (including that of the head) black, the crown only is darker; the pronotum has the centre with a keel, and two longitudinal sulci, the central portion between them appearing darker, especially at the base, but this is due to the pubescence there reflecting the light less. The whole of the upper surface of a rich brick-red.

Hab.—Indian Archipelago; coll. Parry, who obligingly lent the specimen to me with other *Cleridæ*, and to whom I have pleasure in dedicating its description.

Tenerus siamensis, n. sp.

Sanguineo-rufus, tenuissime pubescens, subnitidus, cor-

Digitized by Google

pore toto subtus, prothoracis lateribus, antennis pedibusque nigris, pronoto basi medio tuberculato, elytris unicostatis, suturâ parum elevatâ.

Long. 4½ lin.

Though allied to the preceding in colour, this species can hardly be confounded with it, even if much larger specimens than the type should be found, if the very much finer and sparser pubescence and single conspicuous costa of the elytra are noticed. The head is shining, spotless, mouth, palpi and antennæ black, thorax shining, sides widely black, with a shallow depression each side of the centre of the disk, and a shining tubercle in the middle of the base; elytra even, parallel, a single raised costa from the base to near apex, the second and third costæ barely visible.

Hab. — Siam (Mouhot); coll. Gorham (e Mus. Saunders).

Tenerus cruentatus, n. sp.

Brevior, sanguineo-rufus, immaculatus, nitidus, pronoto basi tuberculato, elytris unicostatis suturâ vix elevatâ.

Long. 3 lin.

Allied to *T. siamensis*, but distinct by the coloration; the thorax is visibly punctured under a very strong lens, the elytra impunctate, the costa distinct, but terminating before the apex.

Hab. — Laos (Mouhot); coll. Gorham (e Mus. Saunders).

Tenerus ceramensis, n. sp.

Nigro-fuscus, capite ferrugineo, nigro-notato thorace ferrugineo, disco et margine antico nigris elytris flavo-ferrugineis limbo externo apiceque indeterminate fuscis tricostatis.

Long. 5 lin.

Head with the epistoma and crown black, finely punctured, semiopaque; thorax black in front and down part of the sides, disk black; elytra plainly three-costate, the first conspicuous at the base, the third commencing in the humeral callus, not very distinct but all traceable to near the apex; the margin, except at the base, and about one-third of the elytra at the apex, fuscous.

Hab.—Ceram (Wallace); coll. Gorham.

Digitized by Google

Tenerus javanus, n. sp.

Flavo-testaceus, nitidus, pubescens, capite (vertice summo excepto), antennis (articulo basali et ultimo exceptis), elytrorum apice tibiis tarsisque nigris.

Long. 2½—3 lin.

This species must be very nearly allied to *præustus*, Spin., from which it differs in having the head black with crown only yellow; when retracted into the thorax this is not visible; the thorax is wholly yellow (but it is noticeable that the two spots mentioned in the description of Spin. are not shown in the figure). The antennæ are nearly *black*, the basal joint in one of two examples being yellow in the other, fuscous above, and the terminal joint dirty yellow. The tibiæ and tarsi black, the *claws* only being testaceous. The thorax and elytra are even, the former with scattered distinct punctures.

Hab.—Java (Raffray). Two specimens received while this paper was being written.

Tenerus flavicollis, n. sp.

Cyaneus, prothorace (margine antice excepto) flavo, elytris confertim subtiliter punctatis unicostatis, costâ post medium haud distinctâ, antennis nigris.

Long. 5½ lin.

Head thickly and distinctly punctured, deep blue mouth, and palpi testaceous. Thorax yellow, except in front of the anterior impressed transverse line, where it is blue-black, deeply but less thickly punctured. Elytra deep steel-blue, very thickly and finely punctured, subopaque, the suture a little raised; one raised line distinct at the base, but barely to be traced beyond the middle. Breast, abdomen and legs blue; antennæ black, opaque.

Hab. — Laos (Mouhot); coll. Gorham (e Mus. Saunders).

Obs.—From *T. cyanopterus*, Spin., easily separated by the colour of the body beneath and legs.

Tenerus cyaneus, n. sp.

Cyaneus, nitidus, ore, palpis, pectore, abdomine pedibusque flavis, antennis nigris, articulis tribus basalibus testaceis.

Long. 4 lin.

Head and thorax sparsely and not deeply punctured,

Digitized by Google

shining, almost glabrous; elytra more thickly and deeply punctured, especially at the base, not costate, but with the basal half of the suture somewhat flatly depressed. Mouth, palpi and three basal joints of antennæ yellow; mandibles pitchy; abdomen, breast and legs wholly testaceous.

Hab.—Laos (Mouhot); coll. Gorham (e Mus. Saunders).

Tenerus chalybæus, n. sp.

Cyaneus, nitidus, palpis tantum piceo-testaceis, pube erectâ vestitus, capite thoraceque obsoletissime, elytris creberrime subtiliter punctatis, antennis nigris.

Long. 3½ lin.

This species is more pubescent than either of the preceding blue species; the elytra exhibit no trace of costæ, and are more thickly punctured than in *Cyaneus*.

A specimen in Major Parry's collection has the head with a minute yellow spot in front.

Hab.—Singapore (Wallace); coll. Gorham and Parry.

Tenerus doreyanus, n. sp.

Niger, capite thoraceque nitidis, antennis flavis, articulis tribus basalibus totis, sequentibus externe fuscis, elytris aurantiacis apice late nigris, pube brevi flavo vestitis.

Long. 3¾ lin.

Head obsoletely but visibly punctured; thorax finely punctured in front; disc uneven, shining, a deep transverse impression in front of the middle, and the centre of the base raised in a tubercular manner. Elytra of a fine orange-red for two-thirds or rather more of their length, the apical third velvety black, clothed with a fine thick pile of the same colour as the respective parts of the elytra; impunctate, even; legs black; antennæ testaceous; three basal, and the following two or three joints externally fuscous.

Hab.—New Guinea, Dorey (Wallace); coll. Gorham.

Tenerus andamanensis, n. sp.

Ferrugineus, breviter pubescens, antennis, elytris tarsisque nigro-fuscis, elytris obscure tricostatis.

Long. 3—5 lin.

Head rusty-red, spotless, very finely punctured, subpubescent, shining. Thorax rather longer than wide, a

Digitized by Google

little narrowed in front; the usual transverse impression in front is shallow, very finely and obsoletely punctured, shining, red. Elytra dull leaden-black; in larger examples (females ?) the margin at the base and the suture are very narrowly red; the punctuation is exceedingly close and fine, the costæ only visible in rather rubbed examples; body beneath, scutellum and legs rusty-red, tarsi sometimes fuscous; antennæ black, basal joint sometimes fuscous.

Hab.—Andaman Isles; coll. Gorham and G. Lewis.

Tenerus fuscipennis, n. sp.

Ferrugineus, breviter pubescens, capite thoraceque nigro-notatis, antennis basi excepto tarsisque nigro-fuscis, elytris fuscis vel nigro-fuscis obsolete bicostatis.

Long. 3—5 lin.

Very nearly allied to the preceding, of which perhaps it is only a local variety, the distinctions which exist being in themselves variable. The head has a black spot on the crown, and the thorax one usually on the front margin contiguous, so that when the insect is set straight they appear to be one; but the thoracic spot sometimes does not touch the front margin, and is occasionally wanting. The antennæ have always two or three joints red at the base. The elytra are fuscous, or fuscous-black, clothed with grey or yellow pubescence, the first costa sufficiently visible at the base, the second visible in larger examples only. Tarsi usually darker than in *andamanensis*, but variable.

Hab.—Ceram; Amboina (Wallace); coll. Gorham; Cambodia, Parry.

Tenerus discolor, n. sp.

Flavo-testaceus, capite nigro-notato (interdum fere toto nigro) thorace lateribus et disco plus minusve nigricantibus, nunc lineâ medianâ nunc maculâ antice tantum notato, elytris nigro-fuscis interdum (feminæ ?) basi testaceis, carinulâ juxta scutellum instructis; pedibus nigro-fuscis, femoribus basi testaceis; antennis nigris.

Long. 2½—4 lin.

A very variable species, but to be separated from the two preceding by its average smaller size, totally black antennæ and legs (excepting the base of the femora), and by the usually much larger extent of black on the head

Digitized by Google

and thorax, the marks on the latter vary from a spot on the front margin only to a broad central vitta, with the whole front margin and sides black. The scutellum is of the same colour as the base of the elytra, *i. e.* in those specimens with yellow base it is red, in others dark. The elytra are subpubescent and dull, the first costa represented only by a keel at the base. In darker examples the body beneath is fuscous, in lighter ones yellow.

Hab.—Ceram, Batchian, Kaioa (Wallace); coll. Gorham; Cambodia, Parry; Batchian, Fry; Common.

Obs.—Variable as this species is, I have no doubt careful search and attention to habits, in the district in which it occurs, will tend to multiply rather than throw into one the number of closely-allied species. The *Teneri* appear to vary very much as *Telephori* do in Europe, some species having the elytra sometimes testaceous and sometimes fuscous, with intermediate varieties, while others are constantly of one colour. The spots on the head seem very constant, as it is, for example, in our *Telephorus lividus*, which, nevertheless, has both black and yellow elytra.

Tenerus mindanaonicus, n. sp.

T. andamanensi affinis; ferrugineus, capite supra, antennis, thoracis, margine antico, elytris, pedibus (femoribus basi exceptis), abdominisque apice nigro-fuscis elytris unicostatis.

Long. 4 lin.

Head black above, mouth, palpi and underside red, but little, shining, finely punctured; antennæ entirely dull black. Thorax rusty-red, obsoletely but visibly punctured, the middle portion of the anterior margin black, the base tuberculate before the scutellum, which is dark. Elytra fuscous-black, with a fine yellowish pubescence; a single costa terminating about a third of their length from the apex, and the suture moderately raised. Femora and breast red, clouded at the knees and the latter on the sides, abdomen with the first three segments yellow and shining, the remainder black.

Hab.—Mindanao (Semper); coll. Gorham.

Tenerus difficilis, n. sp.

Nigro-fuscus, capite thoraceque flavis, hac margine

Digitized by Google

antico, illo occipite nigro, elytris nigro-violaceis, pedibus nigris, genubus tibiisque posticis flavis.

Long. 3½—4 lin.

Head yellow, crown with a round black spot, thorax yellow, shining, the anterior margin (and in the ♂ ?), the sides and two spots on the base black, of equal width with the elytra, finely punctured, anterior impression shallow. Elytra cylindrical blue-black, very finely and closely punctured. Legs pitchy, anterior knees and hind tibiæ (except at their apex) testaceous. Antennæ black.

Hab.—New Guinea, Dorey (Wallace).

Tenerus incertus, n. sp.

Niger, nitidus, capite, thorace, antennis, pedibusque testaceis, thoracis margine antico nigro.

Long. 3 lin.

Allied to the preceding, but distinct by the wholly yellow head, legs and antennæ; the elytra are quite black; the thorax tumid at the middle of the base.

Hab.—Aru, Wallace.

Tenerus persimilis, n. sp.

Flavo-ferrugineus, capite thoraceque minute punctatis; elytris indistincte unicostatis; subtilissime punctatis, plaga subapicali, apiceque ipso nigris, antennis nigris articulis tribus basalibus flavis.

Long. 5 lin.

Mas.—Articulo quinto abdominali medio tuberculato.

Apparently very much like *T. bimaculatus*, Lap. The thorax in the male is tubercularly elevated in the middle of the base, less so in the female; the elytra with the first or sutural costa visible as far as the middle, the second scarcely perceptible; the subapical plaga commences near the margin about one-third from the end, and widening turns inward to near the suture; the apical margin is somewhat expanded and is black in the female, but very narrowly so only in the male.

Hab.—New Guinea, Dorey (Wallace); ♂ coll. Parry; ♀ Gorham and Fry.

Tenerus apicalis, n. sp.

Flavo-testaceus, antennis (articulo primo excepto), abdominis elytrorumque apice late nigris.

Long. 4½ lin.

Of the section with elytra black in the apical portion,

Digitized by Google

this may be distinguished by the spotless head and thorax, the latter sub-tuberculate at the base, the elytra with very indistinct traces only of costæ, and the abdomen with the first two segments yellow, the second black on the sides. The extreme apex of the tibiæ and the tarsi are blackish.

Hab.—Ceylon (Nietner); coll. Fry.

Tenerus melanurus, n. sp.

Flavo-testaceus, antennis, thorace maculâ magnâ in margine antico, postice attenuatâ, elytrorumque apice nigris.

Long. 4¾ lin.

Head and thorax closely and rather distinctly punctured, the latter with a tubercule a little before the middle of the base, a large black spot commencing on the front margin, and extending to the tubercule, where it is attenuated into a point. Elytra with an abbreviated distinct costa, and the suture raised at the base, apex neatly and not widely black, legs entirely pale.

Hab.—Ceylon; coll. Gorham.

Obs.—This is very near to a species in the British Museum named "*signaticollis*," but it is observable that Spinola's description and figure both give two spots on the anterior margin of the thorax, and that its habitat is different.

PRIONOPHORUS, Blanchard.

Type, *P. bicolor*, Blanch.

ICHNEA, Castelnau.

Type, *I. lycoides*, Cast.

The following is an attempt at a tabular view of the species of *Ichnea* described here, with those known to me. The groups shade into one another, and the analysis here given cannot be rigidly applied.

I. Palpi cylindric; elytra widened gradually to the apex.

A. Prothorax wider behind than in front, sides more or less sinuate:—*lycoides*, Cast.—*dimidiatipennis*, Spin.—*mexicana*, Chev.—*religiosa*, Chev.—*trilineata*, Chev.—*funesta*, Gorh.—*disjuncta*, Gorh.—*mimica*, Gorh.

AA. Prothorax about equal before and behind, but longer than wide:—*mitella*, Gorh.—*subfasciata*, Gorh.

AAA. Prothorax quadrate or sub-quadrate, sides rounded:—*Batesiana*, Gorh.

Digitized by Google

II. Palpi cylindric; elytra oblong, scarcely widened posteriorly, sides rounded.

A. Prothorax longer than wide:—*cnoplioides*, Spin.—*divisa*, Chev.—*circumcincta*, Chev.

AA. Prothorax subquadrate:—*plumbea*, Gorh.—*incerta*, Gorh.

III. Palpi cylindric; elytra oblong, sides straight:—*fumigata*, Gorh.—*obscura*, Gorh.—*impressocollis*, Gorh.—*Fryana*, Gorh.—*suturalis*, Klug—*vitticollis*, Gorh.—*nitida*, Gorh.

IV. Palpi sub-securiform:—*calceata*, Chev.

Ichnea funesta, n. sp.

Atra, subnitida, capite, prothorace (lateribus maculaque dorsali exceptis), vittâ humerali, femorumque basi ferrugineis, palpis rufis apice fuscis.

Long. 4—4¾ lin.

Black; head red, incision of eyes well defined; antennæ black; thorax with the sides sinuate, anterior margin narrower than base; the sides are entirely black, and also a triangular patch on the base reaching nearly to the front, hence above only two sublateral lines and the front margin are red. Elytra punctate-striate, the striæ confused, and punctures confluent before the apex; a vitta occupying the humeral callus red. Legs black, base of femora red, the front pair black above.

Hab.—Amazon (Ega, Santarem), Bates; coll. Fry and Gorham.

Ichnea subfasciata, n. sp.

Ater, capite, prothorace vitta sublaterali alterâque in medio marginis anticæ, humero et fasciâ post medium suturam non attingente, femorum basi, pectoreque testaceis.

Long. 4 lin.

Somewhat resembling *I. funesta*, but wider, the thorax less contracted in front and its sides nearly straight; it is also differently coloured, having a narrow line on each side and a vitta on the front margin testaceous; the elytra are deeply punctate-striate, with a humeral vitta, and a fascia commencing widely on the margin, but terminating in a point about the centre of the elytra; the breast is yellow.

Hab.—Amazon (Ega), Bates; coll. Fry.

Obs.—This may be the female of *funesta*, but I am not able to assert their sex. I have only seen three specimens.

Digitized by Google

Ichnea mitella, n. sp.

Testacea, subopaca, thorace lineis duabus dorsalibus, basi sæpe confluentibus, elytris dimidio basali (humeris exceptis) apiceque late nigris, antennis et pedibus nigris, his femoribus basi, illis articulo ultimo ad apicem testaceis.

Long. 4½—5½ lin.

Var.?—Elytris nigris, vitta humerali, guttâque marginali pone medium flavis, pectoris lateribus abdomineque etiam infuscatis.

Allied to *lycoides*, and still more nearly to *subfasciatus*; distinguished from the former by the absence of costæ on the elytra and the colouring, and from both by the pale apex of its antennæ. Head yellow; thorax yellow, the sides narrowly, and two lines on either side of the centre often joined at the base black, having only a central vitta on the front margin yellow. Elytra wider at the base than in *lycoides*, thickly punctured, the punctures subseriate, black, with a vitta on the shoulder, a fascia, very variable in width, usually dentate on its basal margin and extending more or less down the margin and suture towards the apex, of an orange-yellow. Legs black, the femora yellow, except at the knees, the apical joint of the tarsi and claws also testaceous. Antennæ black, with apical half of the last joint pale yellow.

The variety appears only to differ in having the central fascia indicated upon the margin alone, and the black colour predominating.

Hab.—Amazon (Bates, by whom many specimens were collected at Ega, S. Paulo and other places).

Ichnea disjuncta, n. sp.

Testacea, subopaca, thoracis lateribus et maculâ basali elytris maculâ magnâ basali marginem non attingente, apiceque nigris, antennis pedibusque etiam nigris his femorum basi testaceis.

Long. 4—4½ lin.

Closely allied to *mitella*, the head with the eyes narrower, the thorax has the sides more sinuate, the elytra are more contracted at their base, and have their margins scarcely expanded; it is also more thickly pubescent, and the yellow pile of the thorax has a silky appearance wanting in *mitella*. The wholly black antennæ will, however, prevent its being confused with *mitella*, while

Digitized by Google

the absence of raised interstices separate it from *lycoides*, the eyes are even less prominent than in that species. I do not think it will prove to be the alternate sex of either.

Hab.—Amazon, Ega (Bates); coll. Fry.

Ichnea mimica, n. sp.

Nigra, opaca, capite, thoracis lineis duabus sublateralibus, callo humerali, fasciâ pone medium, femorumque basi flavis, elytris postice ampliatis, basi sub-tricostatis corpore subtus piceo, pectore in medio, et abdominis segmentorum limbo testaceis.

Long. 5¼ lin.

This species bears a striking resemblance to *Platynoptera Goryi*, the palpi, however, are not hatchet-shaped. The thorax has its sides not sinuate, as in that species, but nearly straight, only subtuberculate in the middle, wider at the base than in front, the elytra are widened nearly as in *P. Goryi*, the punctures deeper, the fascia is interrupted by the suture. The reflexed edge of the elytra is yellow as far as the fascia, and there is an indistinct short line of the same colour between the humeral vitta and the suture, which also has a few yellowish hairs.

Hab.—Amazon, Pará (Bates); coll. Fry.

Ichnea Batesiana, n. sp.

Nigra, subopaca, capite subtus, maculâque parvâ occipitali, thorace lineâ medianâ, scutello, elytris margine humerali, fasciâque irregulari in medio, a suturâ interruptâ, femorumque basi flavis.

Long. 4—5 lin.

A remarkable species, in form resembling a *Platynoptera*, the palpi are, however, not hatchet-shaped; it also somewhat resembles certain *Pelonia*, but is very distinct, by the reduced, and confused third to eighth joints of the antennæ, as well as in the form of the palpi.

Antennæ half the length of the body. Head and thorax with erect brown setæ, the latter with the sides evenly rounded, formed much as in *P. pilosum*. Scutellum yellow, elongate triangular. Elytra rather wider than thorax at the base, widening to about three times that width before the apex, which is suddenly rounded, obsoletely punctured, subcoriaceous of a dull black, the margin at the humerus and central fascia yellow, the latter not

Digitized by Google

reaching the suture, and sometimes almost divided in its middle. The base of the thighs, and trochanters yellow.

Hab.—Amazon, Ega (Bates); coll. Fry.

Var. ?—*peloniodes.*

Elytris minus ampliatis, fasciâ paulo distinctâ, margine usque ad medium tenuiter flavâ.

Hab.—Amazon, Santarem (Bates).

A male and female taken in copulâ present no important external differences, and afford valuable evidence that the structure of the antennæ are at least sometimes alike in both sexes in this genus; the ventral segments are unfortunately too much shrunk and dried for careful study.

Ichnea plumbea, n. sp.

Nigro-picea, subnitida, capite, prothorace (disco excepto) suturâ tenuissime, elytrorum limbo laterali, antennarum apice, femoribusque pallide testaceis; elytris subviolaceis, crebre subtiliter punctatis.

Long. 4 lin.

Closely allied to *enoplioides*, Spin., from which it differs in being wider, the eyes less approximating, the apex of the antennæ pale, the punctures of the elytra less distinctly in series.

Hab.—Amazon (Bates); coll. Fry.

Ichnea incerta, n. sp.

Testacea, antennis (apice excepto), pectoris lateribus, tibiis tarsisque basi, abdomine apice et superne nigris, elytris crebre subtiliter punctatis, basi striatis, nigro-fuscis, limbo toto (humeris late) testaceis; suturâ margineque laterali interdum concoloribus.

Long. 4—4¼ lin.

Allied to *plumbea*, and agreeing with it in having the apex of the antennæ pale; it differs, however, in the colour of the body, which is of a richer orange-red; the tibiæ are yellow at their base and the tarsi at the apex. The elytra are more distinctly striate at their base, and usually have the base widely yellow and the entire margin of the same colour, the suture more widely so towards the middle.

Hab.—Amazon (Bates); coll. Fry.

Digitized by Google

Ichnea fumigata, n. sp.

Atra, opaca, capite flavo, inter oculos nigro, pronoto lineis duabus lateralibus cum margine antico rufis, aureo-pilosis, elytris indistincte tricostatis, punctatis, humeris flavis, pedibus nigris, femoribus basi flavis.

Long. 4¼ lin.

Thorax as wide as long, sides rounded, disk without deep impressions, slightly carinate behind, antennæ black, half the body's length, funiculus very short.

Hab.—Amazon (Bates); coll. Fry.

Ichnea obscura, n. sp.

Atra, opaca, capite subtus flavo, pronoto lineis duabus lateralibus aureo-pilosis, flavis, elytris crebrius punctatis, humeris lineolâ minutâ flavâ, femorum basi testaceo.

Long. 3 lin.

Allied to the preceding; the thorax, however, is narrower in front than behind, the elytra are not costate, the humerus with only a very small yellow line, the head entirely black above.

Hab.—Amazon (Bates); coll. Fry.

Obs.—A male and female taken in copulâ present no external distinction.

Ichnea impressocollis, n. sp.

Nigro-fusca, subnitida, capite thoracis angulo antico, elytrorum margine laterali, femorumque medio flavis, thorace subquadrato lateribus rotundatis, disco utrinque bifoveolato.

Long. 3½—5½ lin.

Mas.? Antennis longioribus, corporis fere longitudinis.

Leaden-black, or fuscous, head, anterior angles of the thorax, femora, excepting the base, and lateral margins of the elytra testaceous, suture very narrowly pale. Eyes coarsely granulate, large, closely approximating in the ♂; palpi pale, black at the apex, subulate. Antennæ black, funiculus of about the length of the head, the three terminal joints in the smaller specimen, which is apparently the male, nearly equal to the remainder of the body in length; in two other examples about half of its length, of these two one is much larger, the other smaller, than the supposed male. Thorax a little wider than long, sides

Digitized by Google

rounded, rather coarsely punctured, a large round fovea on each side of its disk. Elytra rather parallel, finely punctured. The whole insect is clothed with silky yellow, erect pile above.

Hab.—Rio Janeiro; Fry.

Obs.—A remarkable species, recalling certain *Lampyridæ;* three examples were collected by Mr. Fry.

Ichnea Fryana, n. sp.

Fusca, subopaca, subdepressa, pronoto elongato subcylindrico, lineâ mediana lateribusque tenuiter flavis, elytris lateribus late pallide flavis antice subroseis.

Long. 4—4½ lin.

A very distinct species most nearly allied to *vitticollis*. Head fuscous above, yellow beneath; crown with a bifurcate yellow line; thorax elongate, widened a little in the middle, a narrow pale line in the middle and on the lateral margins. Elytra but little widened behind, very finely and closely punctured, the margin broadly pale to near the apex, rosy in front below the shoulder. Antennæ black, scarcely half the body's length. Legs and underside fuscous, varied with pale.

Hab.—Rio Janeiro (Fry); Parana; coll. Gorham.

Ichnea vitticollis, n. sp.

I. suturali, Klug, affinis, nigra subopaca, crebre punctata capite flavo, nigro-trinotato, thorace linea mediana, scutello, suturâ, antennarum articulo ultimo, pedibusque flavis, his tarsis anticis fuscis.

Long. 3½ lin.

This species appears very near to *suturalis*, Klug, the chief points of difference being that the apical joint only of the antennæ is white; the sides of the thorax are not yellow, nor are the elytra margined with the same colour, the suture only (and that not at the apex) being yellow; the front tarsi alone are darker than the legs.

Hab.—Amazon (Bates); coll. Fry.

Ichnea nitida, n. sp.

Nigra, nitida, capite flavo, nigro-notato, thorace parce punctato, linea mediana vel maculis minutis indistincte

Digitized by Google

flavis, pedibus flavis tibiis anticis apice, tarsisque anticis nigris, antennis articulo ultimo albido.

Long. 3½ lin.

Also nearly allied to *suturalis* and to the preceding, but it differs in the whole upper surface being more shining; the thorax is more depressed in front and behind, and less closely punctured; there is very little trace of the median line, it is also more narrowed in front and wider behind the middle. The scutellum is yellow, the elytra black and shining, thickly punctured. Legs very pale yellow, anterior tibiæ black for the apical half, and tarsi of the same pair black.

Hab.—Amazon (Bates); coll. Fry.

PLATYNOPTERA, Chevrolat.

Type, *P. lyciformis*, Chev.

PYTICERA, Spinola.

Type, *P. Duponti*, Spin.

Only separable from *Platynoptera* by the ovate form of the elytra. The species of this genus mimic *Lampyridæ*, while those of the former mimic *Lycidæ*.

Pyticera flavicollis, n. sp.

Nigro-picea, nitida, capite, pronoto, scutello, mesosterno, coxisque cum trochanteribus flavis, elytrorum margine reflexo pallidâ.

Long. 3—4 lin.

Compared with *P. Duponti*, Spin., this species is smaller, and blacker in colour; it is at once distinguished from it by the absence of the pale vitta on the elytral margin. The head is entirely yellow, with the exception that in one specimen in Mr. Fry's and one in my own collection, the crown is marked with pitchy. The yellow scutellum will also serve to distinguish it.

Hab.—Amazon; Ega, Santarem (Bates); coll. Fry and Gorham.

Pyticera coronata, n. sp.

Nigro-picea, nitida, capite thoraceque flavis, hoc vittis

Digitized by Google

duabus magnis, illo occipite nigris, pedibus nigris, trochanteribus pallidis.

Long. 3—4 lin.

Of the same size, and allied to the preceding, but readily distinguished by the coloration of the pronotum; the scutellum is black in two examples, but yellow in a third, which is also larger, possibly indicating a sexual difference. The thorax is more rounded at the side than in *flavicollis*.

Hab.—Amazon, Ega (Bates); coll. Fry.

CREGYA, Leconte.

Type, *C. mixtu*, Lec.

I see no sufficient grounds for separating the species in this genus from *Pelonium*. The constriction of the prothorax behind, and the want of serration in the anterior tibiiæ, are characters found in many true *Pelonia*.

CHARIESSA, Perty.

Type, *C. ramicornis*, Perty.

This genus is inseparable from *Pelonium*, excepting in the form of the body, but as has been well remarked by Lacordaire (Gen. des Col. iv. 480), the latter genus is composed at first sight of most heterogeneous elements, and it would be impossible to refer more species to this type, without rendering the name *Pelonium* superfluous. *Chariessa* has the priority by fourteen years, but as several titles have been suggested for the various forms, e. g., *Lasiodera*, Gray (*Kirbyi*), *Philhyra*, Cast. (*helopioides*), *Brachymorphus*, Chev. (*vestita*). I conceive it will be found simpler to reunite them under *Pelonium*, than to refer the *Pelonia* all to *Chariessa*, a title which has for many years had a typical signification only.

Chariessa pilosa, Forst. Gemm. and Harold Cat. p. 1753 (*Lampyris*) = *Enoplium pilosum*, Kl. p. 104, but not *Enoplium pilosum*, Kl. p. 113. It must be retained as a *Pelonium*, of which indeed it formed the type.

PELONIUM, Spinola.

Type, *P. pilosum*, Forster.

Pelonium pilosum, Klug, Mon. p. 369, G. & H. loc. cit. 1754, nec Forst. Spinola, in redescribing this as

Digitized by Google

testaceum (*Buquet*), increases the confusion of synonymy, the latter name being already used by Klug, Mon. p. 367, for a distinct species. I propose the name *Klugii* for it.

Pelonium pustuliferum, Westwood [Proc. Zool. Soc. 1852, 52, pl. xxiv. fig. 8]. However much species from the East may resemble the species of the present genus, their differences will always, we may be sure, justify their separation generically.

The present species is identical with Mr. Pascoe's *Phymatophœa electa* (Ann. and Mag. Nat. Hist. 1876, p. 50), with which Mr. Sharp associating *opiloides*, Pascoe, loc. cit. p. 51, describes as new two other species—*hilaris*, Sharp, *longula*, Sharp. See Ent. Mo. Mag. [1877, xiv. pp. 7, 8], and Gorh. Notes on Cleridæ [Cist. Ent. 1876, p. 89].

Chevrolat has proposed a genus, *Tarandocerus*, for those species of *Pelonium* which have the antennæ of the males with the three terminal joints longer than in the females, and overlapping each other, including as well *Platynoptera lycoides* as *Chariessa pilosa*. Apart from the doubtful advantage of dissociating *lycoides*, Spin., from the *Platynopteræ*, *pilosum* being the first of the described species mentioned by Spinola, becomes, in lieu of any other being indicated, the type of *Pelonium*.

Pelonium semivittatum, Chev. Mém. 1876, p. 37 = *P. helopioides*, Cast.

Pelonium centromaculatum, Chev. Mém. 1876, p. 40. Distinguished by the colour of the prothorax, which is yellow, and by its finer punctuation, and by the black antennæ from *humerale*, Spin. It is very variable in the colour of the elytra and head, and somewhat so in that of the antennæ. In a small series found by Mr. Fry at Rio one has the head entirely yellow, the apex of the elytra is, however, constantly pale.

Pelonium marginipenne, Chev. Mém. 1876, p. 40. This does not equal *P. marginipenne*, Spin. i. p. 363; if I am right in referring a specimen in Mr. Fry's collection to Chevrolat's species, it is, I believe, only a variety of *centromaculatum* with the elytra nearly black.

Pelonium humerale, Spin. i. 366, G. and H. Cat. 1754 = *P. vitticeps*, Blanchard, scc. Fry.

Digitized by Google

Pelonium præustum, Spin. G. and H. Cat. loc. cit. = *seminigrum*, Chev. G. and H. sec. Chev. Mém. p. 7, note. If the reference is correct this species is found over the whole South American continent. An example in Mr. Fry's collection is from La Plata.

Pelonium rufipes, Klug, G. and H. Cat. p. 1755, is distinct from *trifasciatum*, Cast.

Pelonium insigne, Chev. Rev. et Mag. de Zool. 1874, 1875, sine habitat. Taken by Mr. Fry at Rio, also from Espirito Santo.

Pelonium optabile, n. sp.

Fuscum, subnitidum, antennarum articulo basali et apicali, prothoracis lateribus antice, elytris vittâ laterali pone medium latissimâ, femoribus apice tibiisque pallidioribus.

Long. 8½ lin.

Antennæ somewhat longer than head and thorax, joints two to eight about equal to the three apical; these latter, but especially the eleventh, paler. Thorax with the disk dark in the centre, the anterior angles and sides in front pale; longer than wide, sides scarcely sinuate, contracted at the base. Elytra twice the width of the latter, widened, and the lateral margin somewhat expanded behind the middle; varied with pale and dark fuscous-yellow, but with a conspicuous pale patch on the sides where most expanded.

Hab.—Minas Geraes; coll. Fry.

Obs.—This species mimics *Lampyridæ*, of the genera *Hyas* or *Cladodes*, in colour and pattern.

Pelonium ruficolle, n. sp.

Rufum, elytris testaceis, suturâ fasciisque tribus nigris, basi punctatis, thorace parce punctulato, lateribus fortiter lobatis, antennarum clavâ fuscâ.

Long. 5 lin.

Allied to *rufipes*, Klug, but besides the different colour the thorax has the sides very much more strongly lobed. The scutellum is red, and, the suture being black, it is surrounded with that colour.

Hab.—Rio Janeiro (Fry), Parana; coll. Gorham.

Digitized by Google

Pelonium semirufum, n. sp.

Elongatum, sub-parallelum, capite thoraceque nigris, ore cum palpis rufis; elytris rufis, tertiâ parte apicali nigrâ, corpore subtus rufo, pedibus nigris femorum basi, tarsorum apice rufis.

Long. 5 lin.

Head and thorax a little shining, sparsely and deeply punctured, sides of the latter lobed in the middle. Elytra wider than thorax, chestnut-red, with the apical third black, less widely so at the suture, with obsolete punctures in series as far as the red portion reaches, subpubescent, shining. Meso-, and metasterna, with the abdomen red. Legs black, base of femora and last two joints of tarsi red. Antennæ as long as the head and thorax, black, basal joint red beneath.

Hab.—Rio Janeiro (Fry).

Pelonium Badeni, n. sp.

Rufum, capite thoraceque, crebre sub-rugose punctatis, nigris, semi-opacis, elytris castaneo-rufis, fasciâ medianâ apiceque albido-flavis, inter fasciam et apicem nigris, grosse seriatim punctatis, apice sublævi.

Long. $3\frac{1}{2}$—$5\frac{3}{4}$ lin.

Elongate, head and thorax coarsely and closely punctured, the latter with a smooth line in the centre of the disk, sides tubercularly lobed, base contracted, palpi and antennæ red; in small specimens the latter longer than head and thorax; three terminal joints longer than the funiculus, 9th and 10th much acuminate internally, 6, 7, 8 serrate. Elytra cylindric, sides parallel, their basal half chestnut-red, the extreme base sometimes paler, an oblique pale fascia, and the apex itself obliquely whitish-yellow, the intermediate space black. Body beneath and legs red.

Hab.—Brazil, Rio Janeiro (Fry); coll. Fry, Gorham and Baden.

Pelonium difforme, n. sp.

Elongatum subdepressum, pallide testaceum, antennarum articulis tribus ultimis nigris; elytris pallidis, lineâ humerali punctisque quatuor, unâ basali, tribus obliquis pone mediam sitis nigris.

Long. $4\frac{1}{2}$—5 lin.

Mas.?—Antennis corporis dimidia parte longitudine æqualibus, articulis 9 et 10 apice intus fortius acutis.

Femina?—Antennis brevioribus, clavâ simplici.

Head and thorax with large distinct punctures, tes-

Digitized by Google

taceous, the latter tubercularly lobed on the sides, base somewhat contracted. Elytra paler yellow, with large shallow punctures in series and smaller ones between. A basal very small spot on each side the scutellum, a straight narrow line from the humerus for one-third the length, and three black points obliquely placed, that nearest the suture being about equally distant from the base and apex. Antennæ with the funiculus in the male (?) much shorter than the club, joints 5, 6, 7 being transverse and very short. In the female (?) joint 7 only is transverse, and the club and funiculus of equal length.

Hab.—Santa Catharina (Fry) ♂, Parana ♀; coll. Gorham (e Mus. Saunders).

Obs.—I think I have seen this species named *Buqueti*, Spin., to which it approximates in pattern.

Pelonium bipunctatum, n. sp.

Elongatum, subdepressum, flavo-testaceum, nitidum antennis pedibusque nigris, his femoribus ad basin, tibiisque in medio flavis, illis clavâ elongatâ articulis duabus primis intus acuminato-productis; elytris flavis, striato-punctatis, ante apicem punctis nigris notatis.

Long. 3½ lin.

In form and structure of the antennæ allied to *difforme*; the latter are about half the length of the body, basal joint pale yellow, remainder fuscous, mandibles and apex of the palpi black. Head and thorax sparsely punctulate. Elytra testaceous, paler towards the apex, deeply punctate-striate for two-thirds their length, each impressed with a black dot one-third from the apex. Legs, base of the femora and the tibiæ ringed with pale yellow, the membranaceous portion of the tarsi and claws of the same colour.

Hab.—Santa Catharina; coll. Fry.

Pelonium micans, n. sp.

Breviter ovatum, rufo-testaceum, nitidum, capite thoraceque parcius punctatis; elytris seriatim punctatis, pube brevi sericeo-micante dense vestitis.

Long. 3 lin.

Allied to *voriabile*, Spin., but larger; the thorax especially wider, more sparsely punctured and more shining. The elytra are more widened posteriorly, and

Digitized by Google

are densely covered with a silky pubescence. The antennæ have the ninth and tenth joints triangularly acuminate internally, and these joints are red; the terminal joint is wanting in the single specimen I possess.

Hab.—Brazil.

Pelonium irroratum, n. sp.

Breviter oblongum, testaceum, elytris ampliatis convexis fusco-irroratis fortiter punctatis, punctis irregulariter dispositis, fuscis, antennarum clavâ nigrâ.

Long. 2—2½ lin.

Mandibles black, at least at the tip, head and thorax obsoletely punctured, shining, the latter lobed, but not strongly at the sides. Elytra very much widened behind, sparsely and irregularly punctured; the punctures fuscous, this colour often filling the intermediate spaces, and being especially condensed near the scutellum. Antennæ pale club-black.

Belonging to the *variabile* group, but distinct from any other by the fuscous punctures.

Hab.—Amazon (Bates); coll. Fry and Gorham.

Pelonium ridens, n. sp.

Oblongum, flavum, nitidum, elytris vittis duabus obliquis cum linea submarginati conjunctis tibiis tarsisque, rufo-ferrugineis; antennis externe nigris.

Long. 4½ lin.

Nearly allied to *vittatum*, Spin., which it resembles in colour, but from which it differs as follows:—The thorax is nearly smooth, the punctuation of the sides and lateral lobe, which is obvious in *vittatum*, here being absent. The elytra are smooth, showing no trace of the impressed series of punctures, but covered with minute irregular punctures and dark dots very slightly impressed. The pattern is quite different, and consists of an oblique stripe which, starting from near the scutellum, continues in a line from the humerus nearly parallel to the margin; this line terminates before the apex, where it is joined by a second oblique stripe commencing near the suture at the middle; these stripes are of a rich orange-yellow. The ground colour of the elytra is of a paler yellow than the head and thorax. The antennæ are apparently ten-jointed, the seventh joint, or the one preceding the club, is short;

Digitized by Google

the eighth is concealed; indeed, with a Stanhope lens I can see no trace of it; the structure of these organs is precisely similar to those of *vittatum*, of which Spinola says it is the suture between the seventh and eighth that is obscure. Externally the antennæ are blackish, internally pale, whitish at the club.

Hab.—Rio Janeiro; Fry.

Pelonium pictipenne, n. sp.

Oblongum, pallide flavescens, nitidum, antennarum funiculo, clavâ externe, capite ex parte, guttisque quinque elytrorum, tribus basalibus duabus subapicalibus nigris; elytris albidis medio flavis.

Long. 5 lin.

Antennæ apparently ten-jointed, basal joint red; 2, red tinged with black, 3—7, black, club-black at the base and externally, internally and at apex pale. Palpi yellow. Thorax pale yellowish, tuberculate at sides which are punctulate; disk smooth, depressed. Elytra (excepting in the middle) pale whitish-yellow; the suture at the scutellum and a humeral spot, as well as the reflexed portion of the elytra under the humeral callus, and two triangular, converging, subapical spots black; their surface covered with obsolete, irregular, scarcely impressed dots, darker than the ground colour, and which support subdepressed setæ. Legs pale yellow.

Hab.—Rio Janeiro; Fry.

Pelonium confluens, n. sp.

Oblongum, postice ampliatum, flavo-testaceum nitidum, subpubescens, capite, pectore, guttisque nonnullis elytrorum basalibus et subapicalibus, sæpe confluentibus, nigris; elytris striato-punctatis.

Long. 3—3½ lin.

Most nearly allied to *sex-notatum*, Klug.

Head black, mandibles yellow at the base; palpi and antennæ yellow, the latter fuscous externally. Thorax pale, faintly punctulate at the sides. Elytra with distinct series of punctures obsolete at the apex, testaceous yellow; the scutellar region and humerus are always black, and these markings are often united; towards the apex two or three lineal black markings occur; these, too, are often united so as to form an irregular oblique fascia, the suture,

Digitized by Google

however, here being always pale. Scutellum and metasternum black. Legs pale, tibiæ and tarsi ferruginous red.

Hab.—Amazon (Bates); coll. Fry and Gorham.

Pelonium maculosum, n. sp.

Oblongo-elongatum, ferrugineum, capite thoraceque dense subrugose punctatis, hôc nigro-binotato; elytris fortiter striato-punctatis, nitidis, singulatim maculis quatuor nigris notatis, unâ basali, duabus in medio sæpe confluentibus, unâ tertiâ parte ante apicem.

Long. $2\frac{3}{4}$—$3\frac{1}{4}$ lin.

Not very nearly allied to any other known to me.

Rather elongate, dark rufous, elytra rather paler at their apex. Legs and antennæ pale yellow. Head and thorax thickly punctured, punctures confluent, clothed with rufous erect setæ; little shining, with an elongate black spot on each side the middle, sides strongly lobed. Elytra shining, with rows of large deep punctures vanishing before the apex; somewhat pubescent, with four conspicuous black spots on each; one on the base near the scutellum, two nearly round in the middle, and one generally transverse, about a third from the apex.

Hab.—Rio Janeiro; Fry.

Pelonium? extraneum, n. sp.

Rufo-ferrugineum, antennis, genubus, tibiis tarsisque nigris, capite et thorace crebre punctulatis nitidis, elytris creberrime subtiliter punctatis.

Long. $6\frac{1}{2}$ lin.

Head sparingly but deeply punctate, scarcely so wide as the thorax; eyes well cut out, rather coarsely facetted; antennæ eleven-jointed, seventh and eighth joints very short, especially the eighth, black. Palpi yellow. Thorax a little narrowed in front, with an impressed line in front and near the hind margin; disk moderately, sides more thickly punctured, the latter evenly rounded, without signs of lobes. Anterior femora sub-clavate, middle and hind pairs rather compressed; knees narrowly, tibiæ and tarsi black. Elytra rather convex, a little widened behind; humerus not very prominent, very thickly and finely punctured, punctures confluent; four fine raised lines may be traced, but they are not distinct. The suture is finely raised, and at the apex there is a short sutural stria;

Digitized by Google

underside of the body shining, testaceous, six ventral segments of the abdomen are visible.

Hab.—Laos, Mouhot; coll. Gorham.

Obs.—I provisionally describe this very curious insect here, as its general characters coincide with those of *Pelonium*. The most obvious difference is in the entire absence of tubercular lobes to the thorax. It will form the type of a new genus, but at present I cannot point out satisfactory characters. I have only as yet seen the specimen described which I obtained from the collection of Mr. Saunders.

PHYMATOPHŒA, Pascoe.

Type, *P. pustulifera*, Westwood. (*Pelonium.*)

Mr. Pascoe's remarks, following the characters given, are *nihil ad rem*. The insect is obviously one of the *Enopliides*, having four joints of the tarsi visible above, the basal joint atrophied and covered by the second. The antennæ are differently constructed (though with nearly the same proportions) to those of any *Pelonium* I have examined, their joints being fusiform rather than obconic or bead-shaped. In *Pelonium* the eighth joint, or the one preceding the club, is often so closely connected with the seventh as to make the organ appear to be ten-jointed, while here it is perfectly visible. The tuberculated thorax and elytra, which at the same time are comparatively free from hairs, can be compared to nothing in the South American genus, unless it be a remote resemblance to *P. scoparium*, Klug.

APOLOPHA, Spinola.

Type, *A. Reichei*, Spin.

The reduction of the joints of the antennæ is probably owing to the fusion of two or more of those immediately preceding the club, as is sometimes the case in *Pelonium*. I have not seen the type in any collection.

CHORESINE, Pascoe.

Type, *C. advena*, Pas.

The combination of characters found here is at variance with the idea of it pertaining to the *Cleridæ* at all. Without venturing to pronounce on its admission into families

Digitized by Google

with which I have slight acquaintance, I should be inclined to refer *Choresine* to the *Malacodermata*, probably in the sub-family *Melyrides*.

ORTHOPLEURA, Spinola.
Type, *O. damicornis*, Fab.

ENOPLIUM, Latreille.
Type, *E. serraticorne*, Villers.

This European genus is characterized by having apparently trimerous tarsi, the basal joint being hidden from view above; by this character all those species referred to it by Klug, Westwood, and others are separated.

Enoplium humerale, Horn. G. and H. Cat. p. 1756 = *Pelonium militare*, Chev. Rev. et Mag. 1876, p. 73. If referable, as is probable, to *Pelonium*, and not to *Enoplium*, the latter name will stand.

ANISOPHYLLUS, Westw. [Trans. Ent. Soc. 1876, iv. 493.]
Type, *Anisophyllus obscurus*, Westw. [loc. cit.]

Mr. Westwood says, "This genus is allied to *Enoplium*." The tarsi, however, are given as five-jointed, and, moreover, with all five visible from above. It cannot, therefore, enter into the *Enopliides* without doing violence to the tarsal arrangement adopted by all modern authors, and which seems quite in harmony with the natural affinities observed among the *Cleridæ*. The subcylindric terminal joint of both pair of palpi is an unusual character in this family of *Coleoptera*, but is at least more nearly assimilated to some genera among the *Tillides*, to which sub-family it will more properly be referred.

Digitized by Google

XXVII. *On* Notiothauma Reedi, *a remarkable new genus and species of* Neuroptera *from Chili, pertaining to the family* Panorpidæ. By R. M'Lachlan, F.R.S., &c.

[Read October 3rd, 1877.]

Some time ago I received from Mr. Edwyn C. Reed, of the Museo Nacional of Santiago de Chile, a box of *Neuroptera* from that quarter. The fauna of Chili has always been of special interest to me, in consequence of the many remarkable forms exhibited by it, and the tendency shown to produce European genera that do not exist in the vast regions of tropical America, so that the extreme southern part of the continent forms, as it were, an island, with a large admixture of Palæarctic faunistic elements. The other insects are not less interesting, and Mr. Reed's collection added several curious forms, already known, to my hitherto somewhat scanty materials from that country. But unfortunately it had suffered much from the ravages of *Anthreni*, and some of the best things had been greatly mutilated by them. Among these was an insect that for a long time puzzled me exceedingly, and it is only recently that I became aware of its true position, which I think is certainly in the family *Panorpidæ*, its nearest ally being the extraordinary and rare *Merope tuber* (Newman) of North America. The single individual had suffered perhaps worse than any other, the legs being absent, and the head and prothorax nearly entirely devoured, but leaving an antenna, a portion of a large eye, and a fragment of the front with the maxillary palpi attached thereto, hanging by a thread of *débris*. I have a great aversion to descriptions drawn up from mutilated examples; but in the present instance identity can clearly be established from the singular wings, &c. I propose to call the genus *Notiothauma*, and to acknowledge Mr. Reed's labours in Chilian entomology by associating his name with the species.

Notiothauma, gen. nov.

[Head and pronotum nearly entirely destroyed.] Antennæ long and slender, being composed of about 32

Digitized by Google

joints; basal joint rather long and stout, dilated at the apex; 2nd joint partaking of the same nature, but shorter and thinner; the 3 or 4 succeeding joints short, and nearly quadrate, afterwards the joints to the 14th or 15th are more or less conical, then becoming longer and nearly oval, but those at the tip again shorter. Front (from the fragment that remains) apparently shortly rostrate. Maxillary palpi with a very short basal joint, a long curved 2nd joint dilated gradually to the tip, a shorter (also dilated) but stouter 3rd joint, the 4th and 5th short, the latter obtuse. Body rather slender, subcylindrical. Mesonotum furnished on either side with strong erect spines. Metanotum transversely quadrate. Abdomen (♀) much shorter than the wings, having at the sides the terminal three segments gradually diminishing, so that the apex is nearly conical; the apical segment furnished with a pair of slender 2-jointed hairy cylindrical appendages, slightly curved, and directed outward almost at right angles.

Wings perfectly horizontal in repose, one overlapping the other (as in *Termes*), equal (the posterior slightly the shorter), broad, nearly oblong with broad rounded apices, almost coriaceous in texture (the posterior rather less so); the extreme base of the inner margin with a well-developed nearly semi-circular lobe; reticulation very dense, the nervures and nervules elevated and very strong. In the anterior wings the costal area is very broad, narrowed at the extreme base, where there is a stout, simple transverse nervule; this area is occupied by four to six irregular rows of cellules, mostly irregularly hexagonal in form, smaller and more numerous towards the costa, larger and elongate above the subcosta which is indistinctly separable from the general reticulation, and which ends in a rather large space, before the apex, free from nervules, but very coarsely tuberculate, forming the pterostigma; radius also indistinct, running into the apex, connected with the subcosta by transverse nervules; sector arising at an angle in the radius towards the base, its upper branch running parallel to the radius; the upper cubitus originating at the same point as the sector, the lower from the base of the wing. The sector and cubiti have an infinitude of branches, all connected by numerous transverse nervules, so that nearly the whole wing is occupied by elongate irregularly hexagonal cellules, becoming shorter and more numerous at the apex; at a point on the upper cubitus, about one-third from the

Digitized by Google

base of the wing, is a white dot, the origin of a distinct oblique nervure readily separable from the ordinary transverse nervules; the post-costal nervure runs into the inner margin in an oblique manner, forming a slight fold, the post-costal area densely filled with cellules; the margins very slightly ciliated; at the extreme base of the costal margin is a series of confluent tubercles, whence arise long and strong erect spines; there are similar spines on the principal nervures at the extreme base, which are also found, but distantly placed, on the basal quarter of the radius. The reticulation of the posterior wings is almost precisely similar, but the costal area is much narrower, and contains only two rows of oblique irregularly pentagonal cellules; there are a few shorter and less strong spines at the extreme base of the costal margin, but no others.

Notiothauma Reedi, n. sp.

Body uniformly dark castaneous, rather shining. Anterior wings uniformly pale brownish-grey; neuration castaneous, the radius paler; pterostigma dusky; spines nearly piceous. Posterior wings rather paler, with testaceous neuration and more distinct pterostigma. ♀.

Length of body (excluding head and prothorax), 14 mm. Length of anterior wing, 26 mm.; breadth, 10 mm. Length of posterior wing, 23½ mm.; breadth, 9½ mm. Expanse of anterior wings, 54 mm.

Hab.—Chili (E. C. Reed); in my collection.

I consider this the most extraordinary recent Neuropterous insect yet known. Its external aspect, and especially the colour and texture of the wings, are such as to cause one, at first, almost to jump to the conclusion that he is dealing with some anomalous form of true *Orthoptera*, and the equal wings and their position in repose are equally suggestive of something allied to *Termes*, if the slender abdomen be left out of consideration. In fact, almost the only point indicative of affinity with *Panorpa* (in the absence of the head) is the presence of the two divergent appendages at the apex of the abdomen, as in the ♀ of that genus; and had it not been for the existence of *Merope* it is probable that a suggestion that the insect pertained to the *Panorpidæ* would have met with little serious consideration. As in *Merope* we may predict that the ♂ will be found armed with prominent anal parts. It will be very interesting to learn the mode of life of *Notiothauma;* its ex-

Digitized by Google

tremely depressed and flattened form when in a state of repose would appear to indicate that it may hide itself beneath the loose bark of trees (an idea also somewhat favoured by its colour), and be nocturnal in its habits.

Notiothauma differs from *Merope* in its much longer and more slender (not thickened) antennæ; in the broader and more coriaceous wings, with the very broad costal area of the anterior pair, and much more dense reticulation; the erect spines on the wings and mesothorax; also in the structure of the maxillary palpi, if the figures of them given by Westwood for *Merope* be strictly correct—a point I am unable to decide, as I cannot discriminate these parts in the only example (the type) of *M. tuber* accessible to me.

EXPLANATION OF THE FIGURES.

Plate X. Div. A.

1. *Notiothauma Reedi*, ♀ (somewhat enlarged).
2. Portion of mesonotum (much enlarged).
3. An antenna " "
4. A maxillary palpus " "
5. Apex of abdomen " "

Digitized by Google

XXVIII. *Entomological Notes.* By J. O. Westwood, M.A., F.L.S., Pres. Ent. Soc.

[Read October 3rd, 1877.]

1. *On the Pupa of a Trichopterous Insect.*

My young friend, Mr. Edward B. Poulton, B.A., of Jesus College, recently brought me a pupa of a Trichopterous insect, which Mr. M'Lachlan considers to be that of *Anabolia nervosa*, one of the *Limnephilides*,* which has enabled me to correct certain passages in my Introduction to the "Modern Classification of Insects," ii. pp. 68, 69.

The mode in which insects having a quiescent or necromorphous pupa undergo their change to the perfect state varies in the different orders. In the *Lepidoptera*, in which the limbs are enclosed in separate sheaths and fastened together by a gummy secretion on assuming the pupa state, the legs are drawn out of their sheaths, which remain fixed in their position along the breast, so that, except for the slit down the back of the thorax, the cast skin might often be mistaken for an entire pupa. In the *Diptera*, which undergo a coarctate metamorphosis, the limbs are free, but the insect on shedding the outer skin of the pupa has to burst by force through the indurated shell formed of the last larval skin, whilst such *Hymenoptera* as are enclosed in the pupa state in closed cells or cocoons have to burst through these coverings after assuming the winged state.

In the *Coleoptera* and most of the *Hymenoptera*, the limbs are free although lying inactive along the breast; but immediately before assuming the imago state they become endowed with a small amount of activity, and the insect is able to creep or move about slightly, whilst still entirely inclosed in its pupa skin. In certain *Hymenoptera*, the pupæ of which are enclosed in cocoons of a hard texture, such as the *Cimbicides* and other *Tenthredinidæ*,

* The larva of this species, according to Mr. M'Lachlan, is found commonly in ditches and streams, with long twigs attached longitudinally to the larva-case as balancers.

Digitized by Google

the insect, arrived at its perfect state within its cocoon, has to bite off the end of the latter with its strong jaws; but in the *Trichoptera* a totally different and exceptional process is effected, in consequence of the pupa being furnished with a pair of horny mandibles, quite unlike those of the larva state, and which are thrown off on assuming the winged state in which the mandibles are quite rudimentary.* With these mandibles, which vary in form and strength in the different groups according to the nature of the cocoons,† the pupa cuts its way through the net-work mouth of its case shortly before assuming the perfect state; at which period it is stated in my Introduction, l. c., p. 69, that "it assumes considerable activity, swimming along, as I have observed, by means of its *two hind legs*, which are strongly ciliated, and crawling about by means of its four fore legs, which become detached from the breast." I have, unfortunately, no recollection of the species which I observed acting in the manner thus described;‡ but in the pupa communicated to me by Mr. Poulton, it is the *middle pair of legs* which are fringed with long strong hairs, and which the insect uses in swimming exactly in the same manner as the *Notonectæ* use their hind legs; and M. Pictet also states ("Phryganeides," p. 53) that it is the middle pair of legs which are furnished with "deux rangées symmetriques de poils forts et serrés, disposés comme des barbes de plumes; la nymphe se sert de ces pattes comme d'avirons, pour nager lorsqu'elle veut éclore; ces poils restent à la depouille et n'existent point dans l'insecte parfait."

* In my Introduction, l. c., I have said that the mandibles of the pupa are different in form from those of the larva and *pupa*, the latter word having been inadvertently printed instead of *imago*.

† The pupa before us agrees, in the simple structure of the mandibles, with that of *Sericostoma* (Pictet Phryganides, pl. 4, fig. 3). According to Mr. M'Lachlan, "these mandibles appear to be stronger and more notched in those families of caddice flies that make fixed cases of stones, such as the *Hydropsychides* and *Rhyacophilides*. In the latter there is an inner cocoon to be cut through as well as the ordinary case or grating; in all others the pupa lies free in the case."

‡ The following is a copy from my original note on the subject:— "10th May, 1829. Observed several specimens of a pupa in a pond on Coombe wild, which at first appeared like the pupæ of large gnats. They were swimming slowly about, seeking for some twig to creep up, and the motion was performed by means of their two hind legs, the tarsi and tibiæ being finely haired. On taking them out of the water I perceived a slit down the front of the back of the thorax, and after a little while (after creeping about by means of their *four front legs*) I perceived that they were Trichopterous pupæ, which must have left their cases to change to the winged state. The tail was furnished with two small setæ."

Digitized by Google

The various figures hitherto published of the peculiar structure of the mouth organs of the Trichopterous pupa fail to give a clear idea of their relative position; indeed, in that of *Hydropsyche senex*, given by Pictet, copied in my Introduction, fig. lxvii. 14, vol. ii. p. 61, the maxillæ and labrum are represented as entirely absent. This is the more to be regretted as the intermediate structure of the mouth organs of the pupa, between those of the active biting larva and the rudimentary trophi of the imago, is especially interesting in a morphological point of view. In Mr. Poulton's pupa, however, the mandibles although small are strong, horny, and terminate in an acute point, occupying the middle of the face, and being directed forwards: the maxillæ and lower lip on the other hand are deflexed and lie upon the breast, without any apparent connexion with the mandibles. They appear to be soldered together, the inner margin of the round apical lobes of the maxillæ meeting together, and the large lower lip occupying the central space, the maxillary and labial palpi (each being three-jointed) * extending longitudinally from the outer margin of their respective supports.

As the various figures given by M. Pictet in his great work on the *Phryganeides* do not show either the middle feet of the pupa or the relative position of the maxillæ and lower lip, I have represented them in the accompanying figures:—

DESCRIPTION OF THE FIGURES.

Plate X. B.

Fig. 1. Underside of the front part of the body of the pupa of *Anabolia nervosa* male: *a*, labrum; *b*, mandibles; *c*, basal portion of maxilla; *c**, apical lobe of maxilla; *d*, maxillary palpus; *e*, labium; *f*, labial palpi; *g*, antennæ; *h*, coxæ of fore legs.

Fig. 2. Mandible.

Fig. 3. Middle leg.

2. *Notes on the Parasitism of certain Lepidopterous Insects.*

Referring to my memoir on *Epipyrops anomala*, published in our Transactions for 1876 (p. 519), I now beg leave to lay before the members of the Society a short note on the habits of an analogous (if not the identical) species which Lieut.-Col. Godwin Austen observed upon

* In the female pupa of this species the maxillary palpi are five-jointed.

Digitized by Google

the body of another Homopterous insect, *Aphœna* sp. (also belonging to the family *Fulgoridæ*). His statement is:—

"This *Aphœna* I found at No. *b* Camp in the Dillrang Valley. When found it had on the hinder part of the back a lot of pure white fluffy stuff, which I at the time thought was a part of the insect or else a disease. I pinned the *Aphœna* in the insect box and thought no more about it until the next day, when I proceeded to remove its contents into one of my insect cases. I then found that the white mass had left the body of the *Aphœna*, which had died, and was wandering about the box. I left it in the box and it eventually spun a cocoon, which I gave to my friend Mr. Wood-Mason, with a short note which was written at the time on a label underneath the insects."

Unfortunately the parasite died in the pupa state. It was, however, quite clear that the white material of which the insect had formed itself a case, or at least had covered a case therewith, was the white waxy secretion emitted by the *Aphœna* and other *Homoptera*, and which sometimes, as in the Mexican species figured by Burmeister (Genora quæd, Insect. Part I. pl. 1), extends in filaments to the length of five or six inches.

I am further indebted to Mr. Wood-Mason for an opportunity of examining another instance of this Lepidopterous parasitism occurring upon a specimen of the small Fulgorideous insect, *Eurybrachis spinosa*, represented in Pl. X. fig. C. 1. We here see a Lepidopterous larva (which appears to me to differ in no other respect than in its smaller size from the larva of *Epipyrops anomala*) firmly attached by a strong white band of a membranous texture to the dorsum of the abdomen of the *Eurybrachis* at the base of the third abdominal segment. The specimen being unique, and in spirits, and belonging to the Madras Museum, I have not been able to examine the nature of the connecting cord or band, which is firmly fixed to the underside of the anal extremity of the larva, apparently held by the hooklets of the anal prolegs. There seems, indeed, sufficient reason not to suppose that it is the attenuated portion of the membranous connection between the second and third segments of the abdomen of the *Eurybrachis*, as the parasite larva is too large, and as the *Eurybrachis* is entire so as to prevent the possibility of the larva having been an

Digitized by Google

internal parasite. In like manner we cannot suppose the connecting cord to have been a previous sloughed skin of the Lepidopterous larva, as there would have been no means of attaching one end of the slough to the dorsum of the abdomen of the *Eurybrachis*, although the other end might have been firmly held by the anal prolegs of the larva. Mr. Wood-Mason's suggestion that the connecting cord is the case which the larva had spun for its residence, and of which it had firmly affixed the basal extremity (out of which the head of the larva must at that time have protruded) to the body of the *Eurybrachis*, after doing which it had turned itself round in its case as is the manner of the larvæ of the *Oiketici*, *Psyche* and other sack-tragers, and pushed itself quite out of the distal extremity of the case on being plunged into spirits, holding firmly by its prolegs to the distal extremity of the case. (See Proc. Ent. Soc. Oct. 3rd, 1877.)

The question then arises (and is applicable also to *Epipyrops*), what is the real condition of the relationship between the Homopteron and its supposed parasite? In *Fulgora* and *Aphæna* there is a dense supply of the waxy matter upon which I have assumed that the Lepidopterous larva had fed, as do the larvæ of *Galleria*, upon the wax of the honey-comb, leaving the Homopteron itself untouched and entire, but the *Eurybrachis* before us (in spirit) shows no sign of the waxy secretion. I believe, however, that this insect really does secrete the wax, and that all trace of it is here lost by immersion in the spirit which has dissolved it, as I am aware has been the case with other wax-secreting insects which I have immersed in spirit. In reply to the suggestion that the waxen secretion is simply used by the parasites of the *Fulgora* and *Aphæna* for the formation of its case, I would observe that there are many insects which make use of the materials on which they feed for the formation of their moveable cases, as is done by the larva of the common clothes- or carpet-moth, which uses the wool on which it feeds for this purpose, or by the *Lyda* of the rose, the larva of which makes its case of a strip of the same leaf, on the remains of which it then feeds. Mr. Wood-Mason, on the contrary, thinks these are cases of commensalism, and that the Lepidopterous larva makes use of the Homopteron to transport it from place to place, and that on arriving at the plant which is its favourite food it partially leaves its companion, and, after eating its fill on

Digitized by Google

the leaf, it re-ascends, as must be supposed to be the case with the Lepidopterous larvæ mentioned recently by Mr. Fritz Müller in a communication to "Nature," January 18th, 1877, which is sufficiently curious to warrant its republication, and which is as follows:—

"I have lately become acquainted with an interesting case of commensalism in two caterpillars. The larger, with red head, protected by long branching stinging hairs or thorns, lives on mulberry and other trees. Like other caterpillars protected from enemies by odours, stinging hairs or otherwise, it sits on the upper side of the leaves and is light coloured, the head red, the hairs white. Across its back, between its thorns, there sits a small blackish caterpillar protecting itself by the thorns of the large companion. I took off the small caterpillar from the large one, but it soon occupied again the same place. In order to take a photograph of it the larger caterpillar was anæsthetised with ether; it recovered again somewhat, but after two days it died. The smaller caterpillar has now left its place and taken refuge on another caterpillar in the same box; on this it sits somewhat further forward, on the base of the abdomen. In its former post the place where the small caterpillar sits looks pale, as if it had been scoured. The small caterpillar from above eats small holes in the leaf on which the larger one is sitting. As far as I know no similar case has hitherto been observed."

The caterpillar upon which the smaller one resides belongs to the genus *Doratifera* (Limacodes), as appears from his figure, but the author is silent as to the genus or even order of the smaller caterpillar; and were it not that he calls it a caterpillar (confining the name apparently to the *Lepidoptera*), and that he says it descends and eats holes in the leaf, we might infer that it was a real external parasite, especially as he notes a difference in the appearance of that part of the larger caterpillar on which the smaller one had sat.

Two other instances of more doubtful parasitism in *Lepidoptera* have fallen under my notice. I obtained from the collection of the late J. Curtis two small brown Tineideous moths about the size of *Depressaria Populi*, to one of which was attached a note in the handwriting of Mr. Curtis, "living on the *Bradypus tridactylus*, I believe." I also obtained from one of the boxes of insects collected by Mr. Bates on the Amazon, two small moths,

Digitized by Google

more robust than the former and darker coloured (both of which have the fore-wings apparently naturally truncated not extending to the extremity of the abdomen), with the note "parasitic on the three-toed sloth. Pará. Many found." From the information I received with the last-mentioned specimens, I believe it was among the hairs of the *Bradypus* that the moths had either been reared or had taken up their abode. These moths are now in the Oxford Museum.

Lastly, I recently obtained from a collection of Lepidopterous insects, sent by Mr. Thelwall from Lake Nyassa, and folded in paper, a small moth, measuring 13 lines in the expanse of its broad semi-transparent white fore-wings, marked beyond the middle with a few irregularly-placed black scales and having strongly bipectinated black antennæ, which seemed to me allied to the *Psyche fusca*, although having somewhat the appearance of a male *Orgyia*. With this moth was enclosed the empty cocoon or rather hard horny coarctate puparium of a *Tachina*, with the note that the moth had been reared from the latter. If such had really been the case, I think the larva of the moth must simply have taken advantage of the empty puparium in which to undergo its transformation.

DESCRIPTION OF THE FIGURES.

Plate X. C.

Fig. 1.—*Eurybrachis spinosa?* magnified, with the parasite attached to the dorsal surface of its abdomen.

Fig. 2.—The parasite seen from below, showing the six thoracic legs and eight ventral prolegs, and part of the suspending membrane.

Fig. 3.—The extremity of the body of the parasite, showing the manner in which the membranous attachment is seized by the anal prolegs of the parasitic larva.

---

3. *On the Lepidopterous genera* Himantopterus, *Wesmael, and* Thymara, *E. Doubleday.*

The genus *Himantopterus* was founded by M. Wesmael in the Bulletin of the Royal Academy of Brussels for 1836, for the reception of a very remarkable Javanese insect, still unique, then in the collection of the late M. Robyns, where I had the opportunity of examining it,

Digitized by Google

and which is distinguished by the hind wings being several times longer than the body, and quite linear, giving the insect the appearance of a *Nemoptera*, in fact closely resembling the Indian species of that genus, which I described and figured in my Cabinet of Oriental Entomology, under the name of *Nemoptera filipennis*. (Plate XXXIV. fig. 6.) The insect appeared, and still appears, to me to be related to the family *Arctiidæ*, and is mentioned under that family in my "Introduction" (vol. ii. p. 389).

In 1843, Mr. Edward Doubleday published a copy of Wesmael's figure, together with the description and figure of an allied Indian moth, to which he gave the name of *Thymara zoida* (Zoologist, i. p. 197), the type of which from Northern India is in the British Museum collection. He thus describes the veins of the fore wings of this interesting species:—

"The neuration of the wings is very peculiar, especially that of the posterior; and I am by no means certain that in these I have given the right names to the nervures" which are thus described (see Pl. X. fig. D. 3).

"Costal nervure straight, attaining the costa considerably beyond the middle; subcostal nearly parallel with the costal nervure, bent downwards beyond the middle, so as partly to close the discoidal cell; from which portion two nervules are thrown off to the outer margin, whilst the third proceeds in a direct course to the costa just before the apex; median nervure four-branched, the nervules attaining the outer margin at about equal distances: discoidal cell divided longitudinally by a false nervure which bifurcates at its extremity, one fork striking the discocellular curve of the subcostal, the other the median nervure above and beyond the point where the second nervule from the base is thrown off, thus closing the discoidal cell: radial nervure replaced by a very faint, false nervure."

In 1876, my attention was directed by M. Borré, the distinguished entomologist at the head of the Entomological Department in the Brussels Museum, to the original type of the former genus *Himantopterus*, which is now in the collection of that Museum, and I took the opportunity of carefully examining and delineating the veins of the fore wings, my attention having been recently directed to that subject in investigating the typical arrangement of these organs in the Heterocerous Lepidoptera, as partly illustrated in my memoir on the *Castniæ*,

Digitized by Google

published in the "Transactions of the Linnean Society." The accompanying Fig. 1 represents the arrangement of these veins, which nearly resembles that in Mr. E. Doubleday's genus. (See Fig. 3 copied from his figure.)

My opinion of the real nature of these veins differs, however, somewhat from that of Doubleday. In my view of the subject we have a simple costal vein (1), a subcostal vein (2), with only two branches (2a and 2b), a rudimental discoidal vein (3), with its two upper and lower discoidal veinlets (2b* and 4c*)‡, a median vein (4), with its three ordinary veinlets (4a, 4b and 4c), a sub-median veinlet (5), and an anal vein (6). In this view the small space indicated by † preceding the origin of the third branch of the median vein must be regarded as composed of portion of the third median branch and portion of the lower discoidal veinlet united together—a condition, however, found in very many Lepidopterous wings. The only difference between the wings of the two genera consists in the upper branch of the subcostal vein (2a) arising nearer the base of the wing in *Himantopterus*, which causes the discoidal cell to be less pointed in this genus than in *Thymara*.

Fig. 2 represents one of the tippets of the thorax of *Himantopterus*, proving its real Lepidopterous character.

DESCRIPTION OF THE FIGURES.

Plate X. D.

Fig. 1. Fore wing of *Himantopterus*.

Fig. 2. One of the tippets of the same genus.

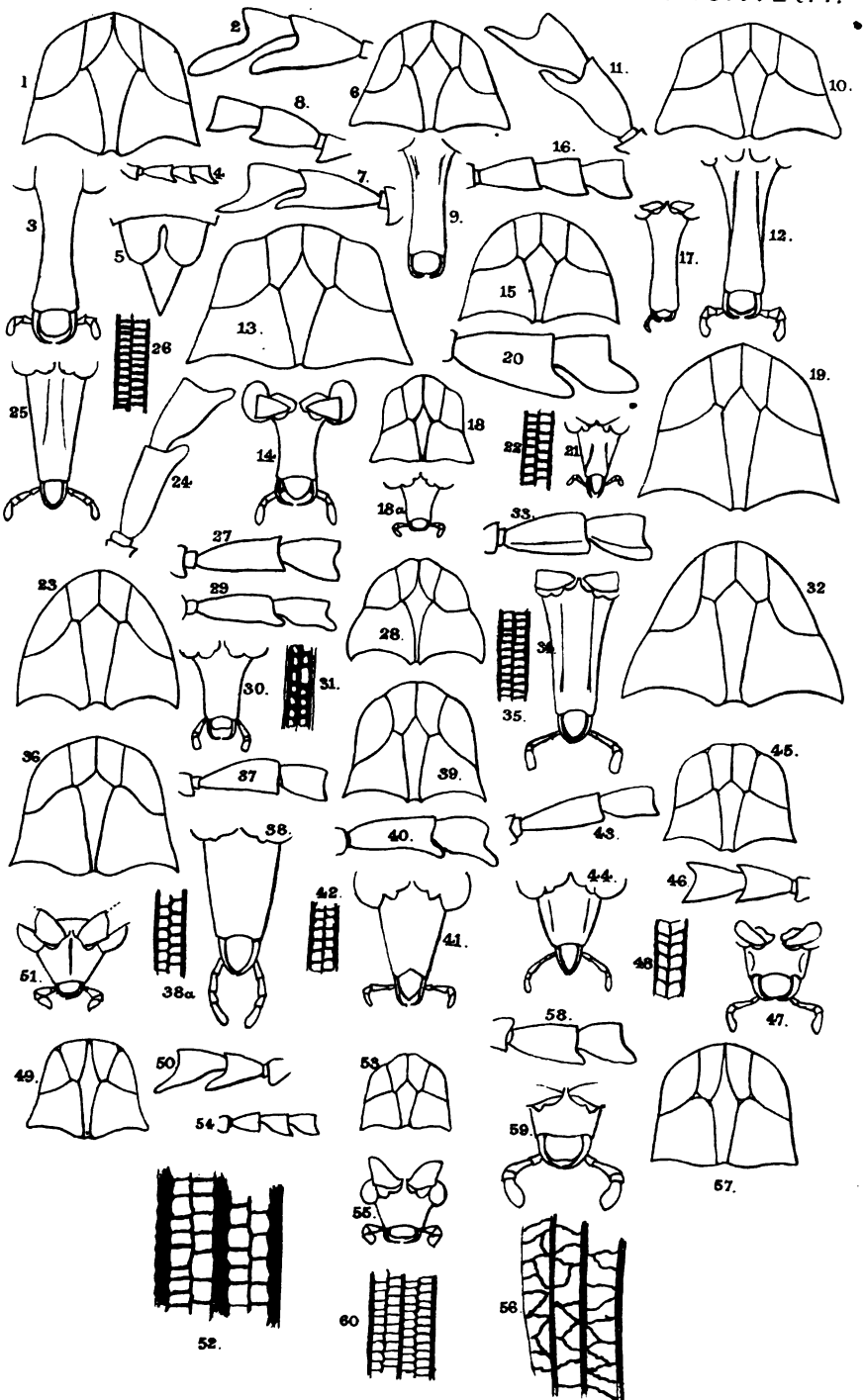
Fig. 3. Fore wing of *Thymara*.

---

‡ I have elsewhere expressed the opinion that these two branches are respectively portions of the subcostal and median systems, and hence have lettered them thus rather than 3a and 3b.

Digitized by Google

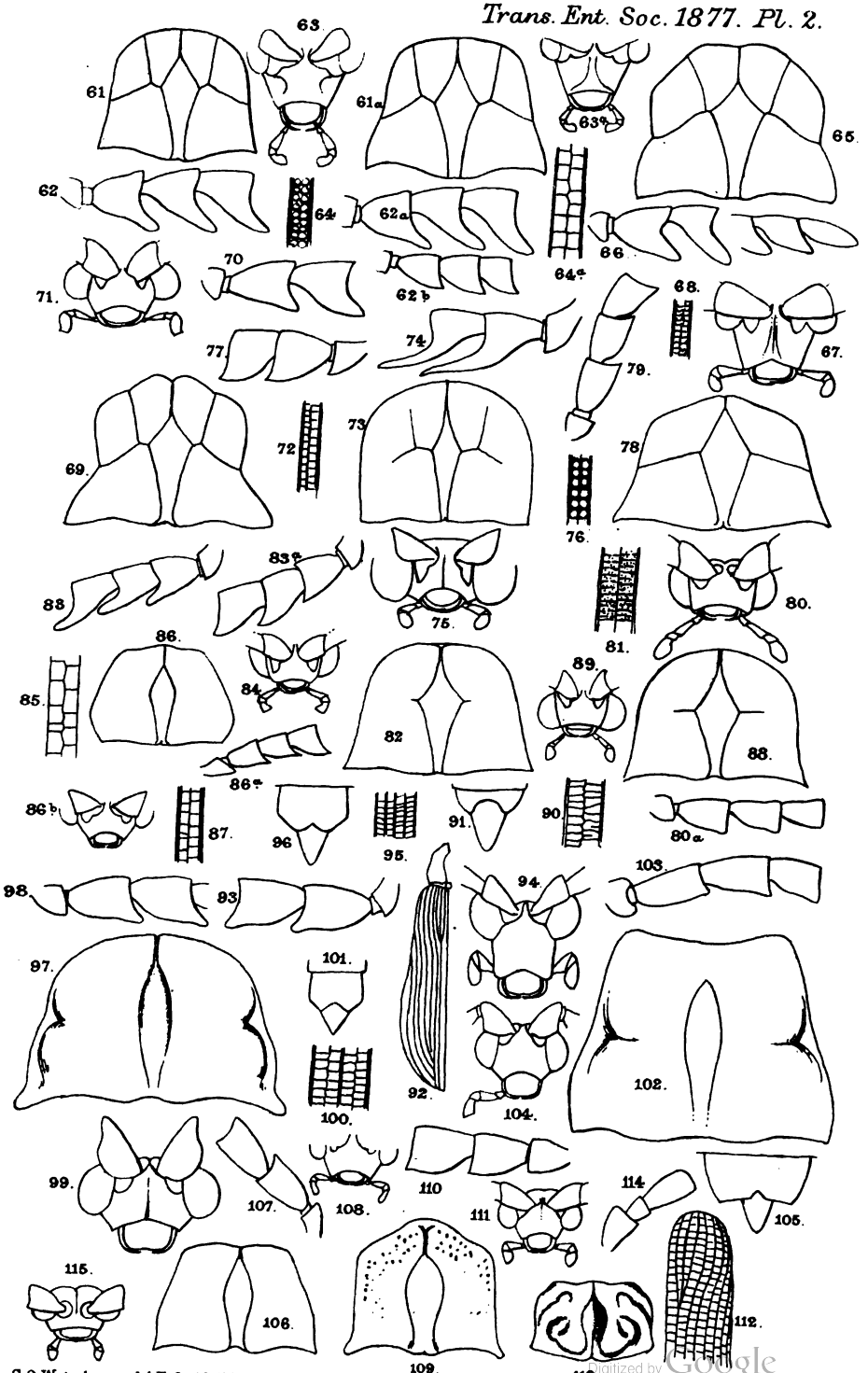
Digitized by Google



C.O.Waterhouse del. E Smith lith.

Digitized by Google

Digitized by Google



C.O. Waterhouse del. E. Smith lith.

Digitized by Google

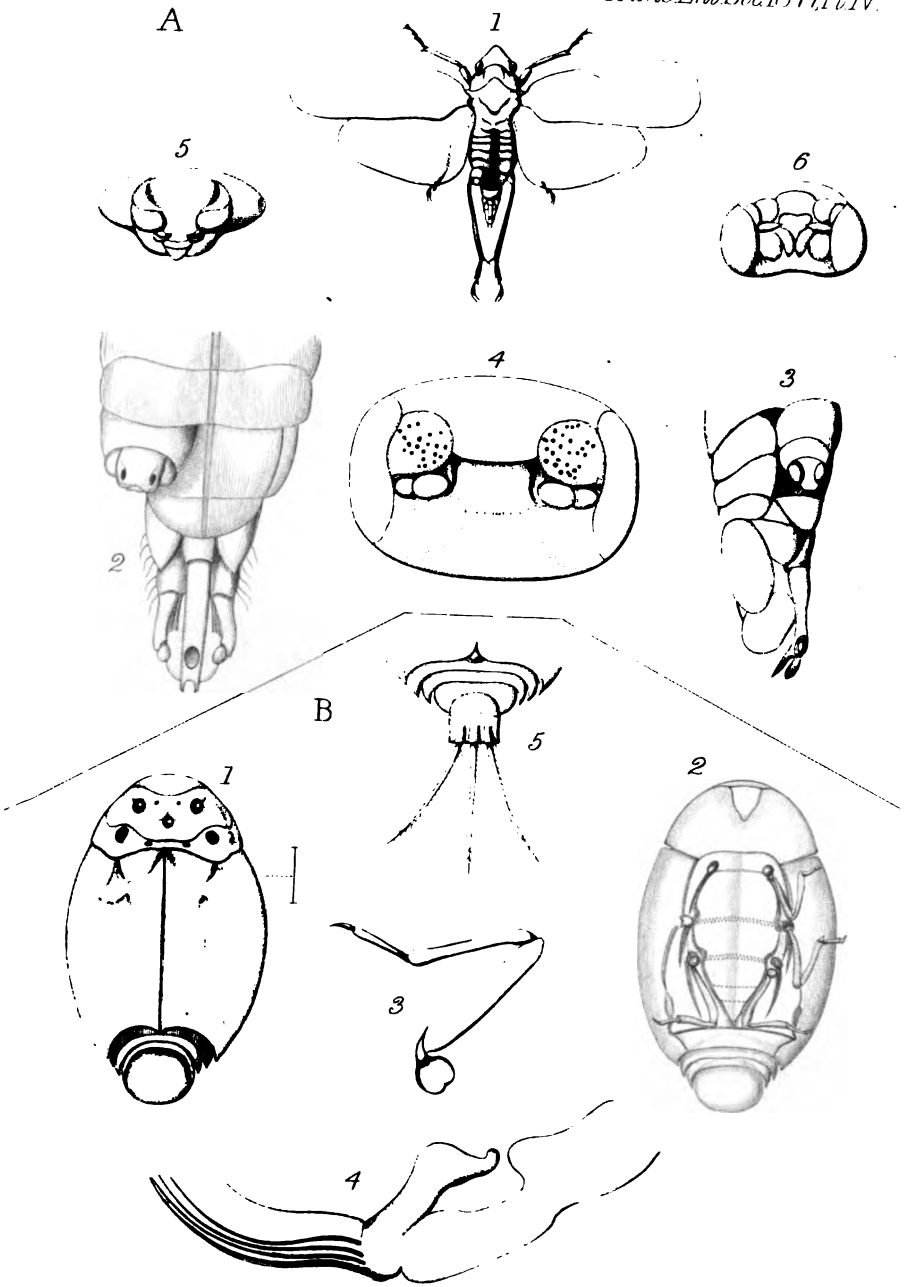
Digitized by Google

E. A. Smith lith. Mintern Bros. imp.

Butterflies of the Amazons.

Digitized by Google

Digitized by Google

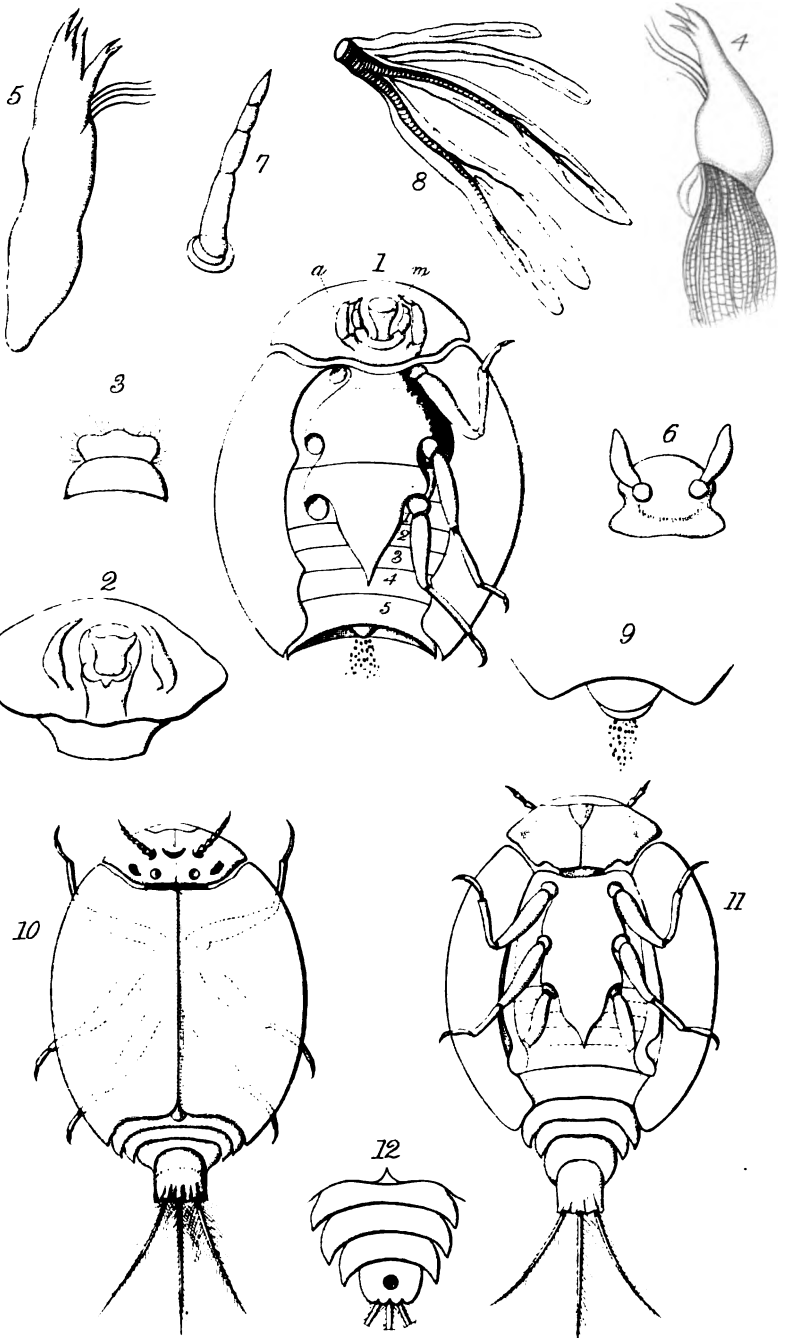


I.O.W. del.

G.Jarman sc.

Digitized by Google

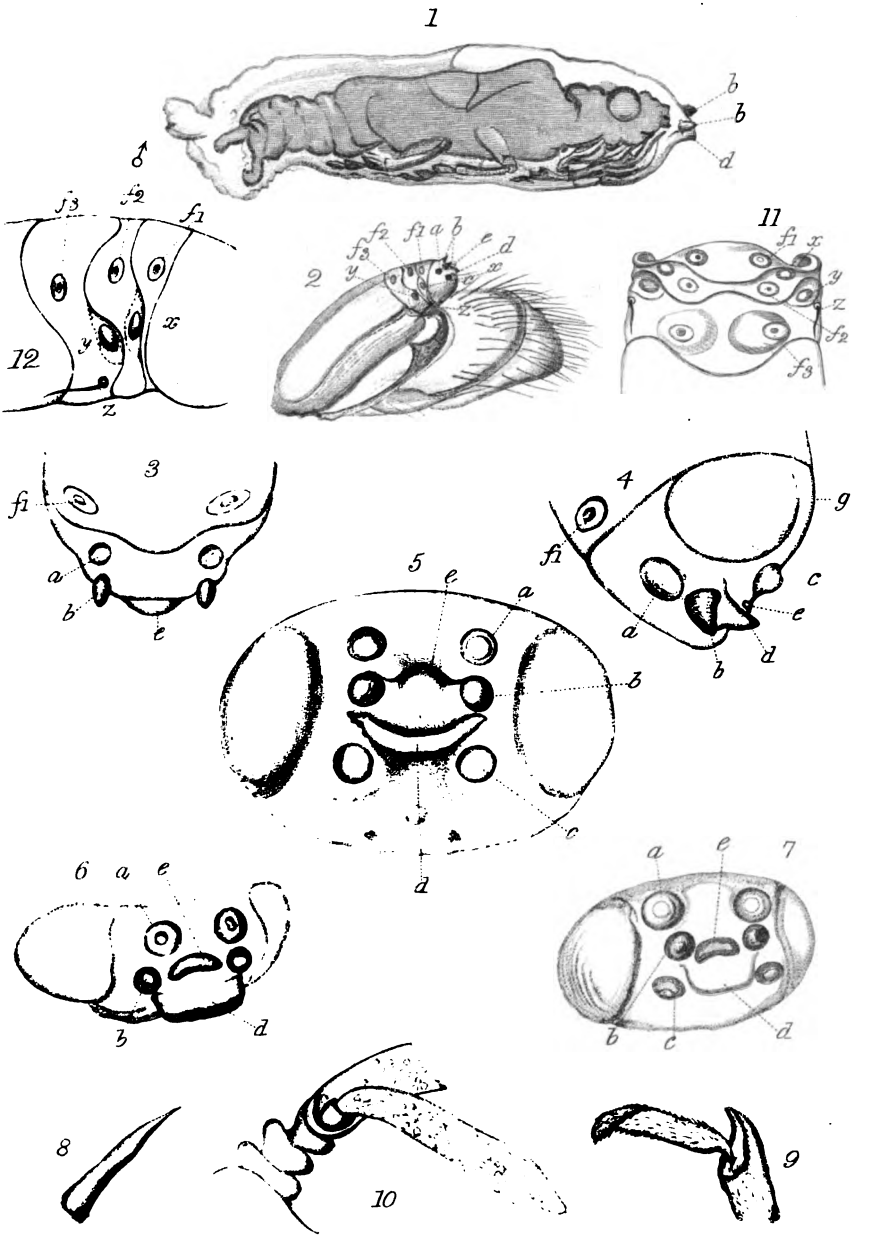
Digitized by Google



G. Jarman

Digitized by Google

Digitized by Google



J. O. W. del.

G. Jarman sc.

Digitized by Google

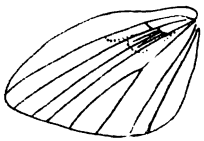
Digitized by Google

MYGALE STRIDULANS
IN A STRIDULATING ATTITUDE.

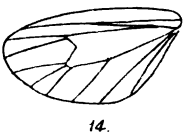
S.E.Peal del. Mintern Brot lith.

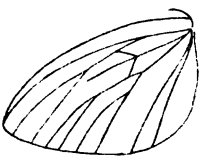
Digitized by Google

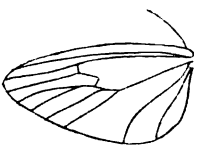
Digitized by Google

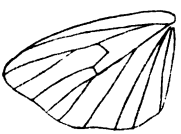

1.

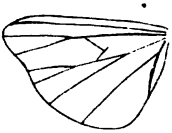
8.

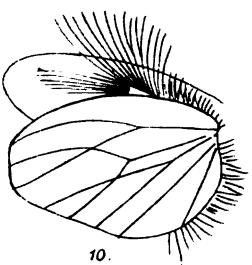

14.

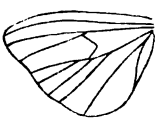

2.


9

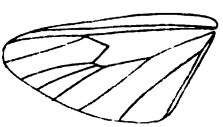

15.

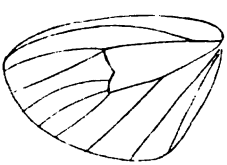

3.

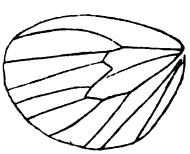

10.

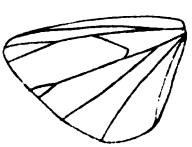

16.

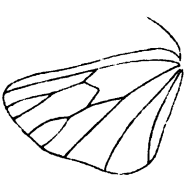
4.

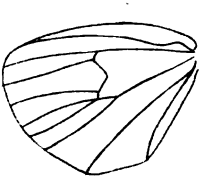

17.

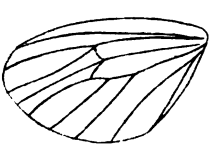

5.

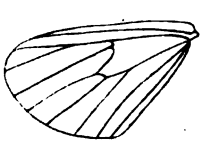

11.


18.

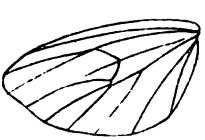

6.


12.


19.


7.

13.


20.

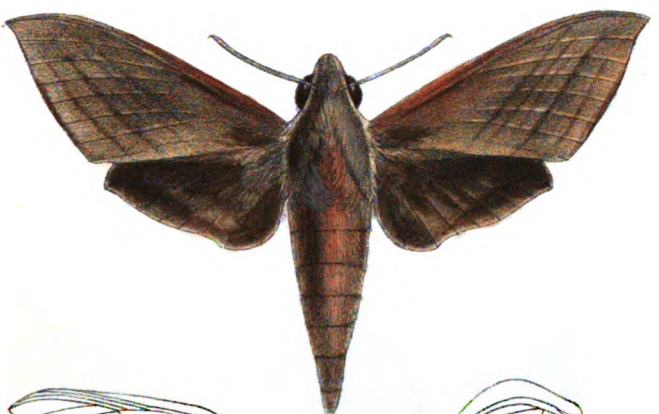
STRUCTURE OF LITHOSIIDÆ.

Mintern Bros imp.

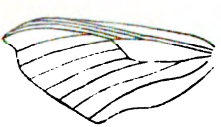
Digitized by Google

Digitized by Google

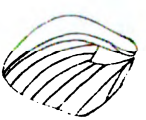
1.



2.



3ª



3ᵇ

3.

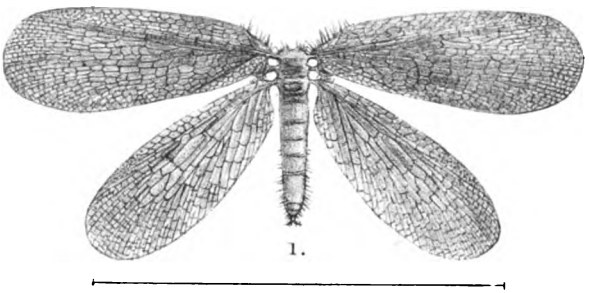
NEW SPHINGIDÆ.

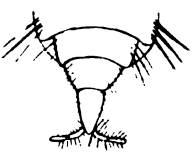
Mintern Bro.ˢ imp

1. Himantoides undata. 2. Chærocampa Walduckii.
3. Hypædalea insignis.

Digitized by Google

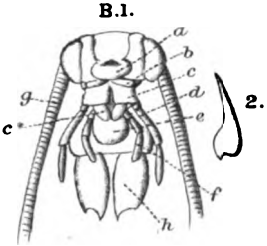
Digitized by Google



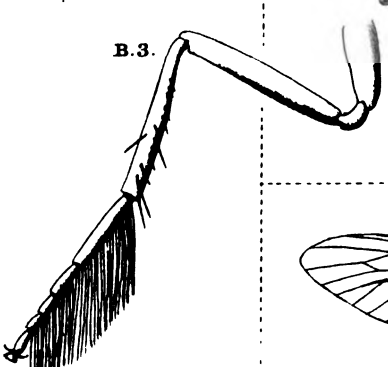


A.

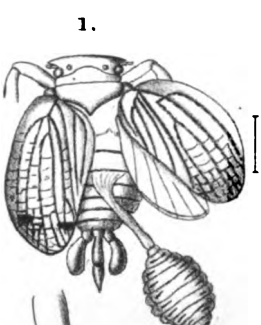
B.1.



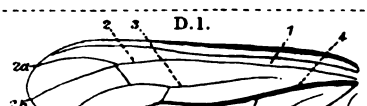
B.3.

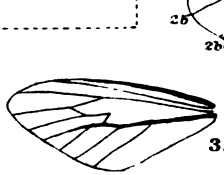


C.



D.1.





Digitized by Google

Mintern Bros imp.

CONTENTS OF PART II.

PAGE

V. Descriptions of new species of the genera *Pseudomyrma* and *Tetraponera*, belonging to the family *Myrmicidæ*. By FREDERICK SMITH 57

VI. A Monograph of the Australian species of the Coleopterous family *Lycidæ*. By CHAS. O. WATERHOUSE 73

VII. Descriptions of new genera and species of East Indian *Tenthredinidæ*. By PETER CAMERON 87

VIII. The Geographical Distribution of *Danais Archippus*. By W. L. DISTANT 93

IX. On the *Lepidoptera* of the Amazons, collected by JAMES W. H. TRAIL, Esq., during the years 1873 to 1875. By ARTHUR GARDINER BUTLER, F.L.S., F.Z.S., &c. 105

X. Descriptions of new genera and of uncharacterized species of *Haltiorinæ*. By JOSEPH S. BALY, F.L.S. 157

ENTOMOLOGICAL SOCIETY OF LONDON,

No. 11, CHANDOS STREET, CAVENDISH SQUARE.

COUNCIL, 1877.

Professor J. O. WESTWOOD, M.A., F.L.S., &c., *President*.

J. W. DOUGLAS, Esq.
J. W. DUNNING, Esq., F.L.S.
HENRY T. STAINTON, Esq., F.R.S. } *Vice-Presidents*.

J. JENNER WEIR, Esq., F.L.S., *Treasurer*.

Rev. T. A. MARSHALL, F.L.S., *Librarian*.

FERDINAND GRUT, Esq., F.L.S.
RAPHAEL MELDOLA, Esq., F.R.A.S. } *Secretaries*.

HENRY W. BATES, Esq., F.L.S.
G. C. CHAMPION, Esq.
Rev. A. E. EATON, M.A.
EDWARD SAUNDERS, Esq.
Sir SIDNEY SMITH SAUNDERS, C.M.G.

The Meetings are held at 11, Chandos Street, Cavendish Square, on the first Wednesday in every month (except January) throughout the year.

The Library is open to Members and their friends every day from One to Six o'clock, except on Saturday, when it closes at Three o'clock.

Members and Subscribers, resident more than fifteen miles from London, who have paid their subscriptions for the current year, are entitled to receive the Transactions without further payment, and to those resident in the United Kingdom they will be forwarded free, by post.

NOTICE.—The Subscriptions for 1877 were due on the 1st January last. Members and Subscribers who have not paid their Subscriptions are requested to do so at the earliest opportunity. Post Office Orders should be made payable to the *Treasurer* (JOHN JENNER WEIR, Esq.), or *Secretary*, and may be forwarded to No. 11, Chandos Street, Cavendish Square, W., or to their private addresses.

Digitized by Google

THE

TRANSACTIONS

OF THE

ENTOMOLOGICAL SOCIETY

OF

LONDON

FOR THE YEAR

1877.

PART V.

LONDON:

PRINTED FOR THE SOCIETY BY C. ROWORTH & SONS,

NEWTON STREET, HIGH HOLBORN.

SOLD AT THE SOCIETY'S ROOMS, 11, CHANDOS STREET, CAVENDISH SQUARE,

AND BY

LONGMAN, GREEN, READER AND DYER, PATERNOSTER ROW.

[*Price 2s.*]

Digitized by Google

Digitized by Google

Digitized by Google

CONTENTS OF PART V.

	PAGE
Proceedings	xxxiii—xciii
Title Page, List of Members, Additions to Library, Index, &c.	

ENTOMOLOGICAL SOCIETY OF LONDON,

No. 11, CHANDOS STREET, CAVENDISH SQUARE.

COUNCIL, 1878.

HENRY W. BATES, Esq., F.L.S., &c., *President*.

J. W. DOUGLAS, Esq.
FREDERICK SMITH, Esq.
Professor WESTWOOD, M.A., F.L.S., &c. } *Vice-Presidents*.

J. JENNER WEIR, Esq., F.L.S., *Treasurer*.

FERDINAND GRUT, Esq., F.L.S., *Librarian*.

RAPHAEL MELDOLA, Esq., F.R.A.S.
WM. L. DISTANT, Esq. } *Secretaries*.

G. C. CHAMPION, Esq.
Rev. A. E. EATON, M.A.
EDWARD A. FITCH, Esq.

GEORGE LEWIS, Esq.
EDWARD SAUNDERS, Esq.

The Meetings are held at 11, Chandos Street, Cavendish Square, on the first Wednesday in every month (except January) throughout the year.

The Library is open to Members and their friends every day from One to Six o'clock, except on Saturday, when it closes at Three o'clock.

Members and Subscribers, resident more than fifteen miles from London, who have paid their subscriptions for the current year, are entitled to receive the Transactions without further payment, and to those resident in the United Kingdom they will be forwarded free, by post.

NOTICE.—The Subscriptions for 1878 were due on the 1st January last. Members and Subscribers who have not paid their Subscriptions are requested to do so at the earliest opportunity. Post Office Orders should be made payable to the *Treasurer* (JOHN JENNER WEIR, Esq.), or *Secretary*, and may be forwarded to No. 11, Chandos Street, Cavendish Square, W., or to their private addresses.

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

3 2044 106 278 187

Digitized by Google

Digitized by Google